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# A Catalog of NASA Special Publications

# A Catalog of NASA Special Publications

NASA Scientific and Technical Information Branch 1981
National Aeronautics and Space Administration
Washington, DC

I

For sale by the National Technical Information Service, Springfield, Virginia 22161

II

# Introduction

THIS booklet attempts to list all Special Publications that have been released by NASA since the series was begun in 1961. It is an effort to still cries from those who have asked for a comprehensive listing. The Special Publication series, which has included some of NASA's most ambitious scientific or technical books, has covered a broad range of topics, including much of the agency's research and development work, its full range of space-exploration programs, its work in advancing aeronautics technology, and many associated historical and managerial efforts. In the nearly two decades that the series has existed, some 1200 titles have borne the SP identifier.

How NASA Special Publications came about may be instructive. Along with several predecessor agencies, NASA research laboratories were accustomed to publishing reports, using a formal structure of four or five separate series, with the characteristics of each series carefully defined. Inevitably this raised the question, how do you categorize reports that don't fit existing patterns? The answer, obviously, is that you put them in another series labeled "special." The backroom gnomes who invented this solution had no knowledge that they were inventing a bushy tail that would soon wag the dog. By the mid-1960s the new series was becoming preeminent among NASA publications, and beginning to win worldwide recognition.

The reason of course is that these were exciting years. It was the time of Mercury, Gemini, and the foundation work for Apollo in manned spaceflight; of Ranger, Mariner, and Surveyor in unmanned probes; of dozens of scientific and applications satellites. It was a time when weather satellites first gave early hurricane warnings, and when relay stations in the sky made intercontinental television an everyday affair. It was a time when spacecraft began to capture and return exciting images from space, of steadily improving resolution and quality, providing insights long denied to terrestrial eyes. The editors producing NASA SPs worked long and hard at obtaining the best reproduction quality that could be managed with the constraints imposed by time and available funds, and the quirks of Government printing regulations.

So the series flourished and grew beyond precedent and dreams. Subsets appeared within the numbering scheme, with special blocks of numbers for handbooks, for histories, for technology-utilization books, for bibliographies, and for spacecraft design criteria. The SP General series bloomed with mission reports, scientific results, aerodynamic treatises, atmospheric models, structural analyses, and planetary atlases. By the mid-1970s it was evident that increasing selectivity and the invention of subsets were not effective in checking the overbalancing growth of the series, and a reorganization took place. Analysis showed that more and more proceedings of conferences were being published, for nowadays research and exploration are almost invariably collective activities, and the practitioners are intensely interactive people. So these publications were split off and given a series of their own, Conference Publications. Handbooks, data compilations, and computer printouts became Reference Publications. Administrative and ephemeral studies were relegated to other crevices of the publishing system. But so wide-ranging are NASA's goals and missions, that the flow of forthcoming SPs remains scarcely abated.

As this booklet goes to press, there are about 450 titles in the General SP series alone. Many have been very popular, often publicized by word of mouth; but promotion and distribution have perhaps never been adequate, and so visibility is somewhat limited. NASA's policy has been to recognize that it can provide copies only to its "extended family"—itself, its contractors and grantees, and the various academic, scientific, and industrial communities involved in space exploration and aeronautics. The general public has been expected to turn to the Government Printing Office or to the National Technical Information Service for publications. Both organizations have recently been displaying talent in book merchandising, but for most of the life of the SP series it has been sadly true that a

would-be buyer had to want a book pretty badly to get it. Nevertheless, several dozen Special Publications have become best sellers, including EXPLORING SPACE WITH A CAMERA, THIS ISLAND EARTH, APOLLO EXPEDITIONS TO THE MOON, MISSION TO EARTH, and THE MARTIAN LANDSCAPE. The popularity of the richly illustrated books came as no surprise to the backroom editors who produce SPs, but who would have foreseen the success of such unassuming titles as CLARITY IN TECHNICAL REPORTING, or SOLDERING ELECTRICAL CONNECTIONS?

Special Publications produced in the last twenty years cover a range of subjects. Many of NASA's glorious moments are found in this series. Some of the SPs are scientific and are distributed mainly within a discipline; others present a popular discussion of NASA's programs and are heavily illustrated with color imagery from space.

Those Special Publications thought to have a wide interest or which were disciplinary classics were printed at GPO, and those published within the last few years or which have been good sellers are still available from GPO.

Copies of all books listed as available from NTIS as well as books allowed to go out of print at GPO are available from NTIS. A note of caution: if you order a book from GPO and a reply indicates that it is out of print, you should reconsider your order. If you have ordered a book primarily for the photography or imagery, a subsequent order from NTIS will not be satisfactory. If, however, your interest is in the text, the black and white photocopy supplied from NTIS will be suitable. NTIS is the sales source for public documents produced by the government agencies. A few printed copies are available initially, but once that supply is depleted, NTIS supplies photocopies.

In the list of publications that follows, a brief description is given together with the original sales source and the publication date. The prices are not listed because they change. Phone or write GPO or NTIS for prices of publications that interest you. GPO will want to know the NASA SP number; NTIS will want to know the seven-digit NASA accession number.

As you browse through this list, and you find an attractive title, take care to notice the date of publication. Many books are out of date, and are of historical value only. For example, some books on Mars predate the 1976 Viking mission.

This capsule account of the growth of NASA SPs is necessarily abbreviated, and omits many tales of the lurches, false starts, and dead ends that accompany many human enterprises. It does suggest, though, that as long as bright people devote their lives to exciting research and exploration, energetic and devoted backroom editors will remain to try to capture their results, and a little of their spirit, on paper.—Kay E. Vogelwede.

Addresses for ordering publications

GPO:

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

(202) 783-3238 or (202) 783-3311 Price information; orders

NTIS:

National Technical Information Service
5285 Port Royal Rd.
Springfield, VA 22161

(703) 487-4780 Information or document accession number
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# General

### NASA-Industry Program Plans Conference, July 28-29, 1960

*I. H. Abbott, M. B. Ames, H. L. Dryden, et al.*

N63-90346 126 pp
Avail NTIS 1960

### Proceedings of a Conference on Results of the First U.S. Manned Suborbital Space Flight

*H. L. Dryden*

N64-80458 76 pp
Avail GPO 1961

### Proceedings of First National Conference on the Peaceful Uses of Space

N64-81182 179 pp
Avail NTIS 1961

### Results of the Second U.S. Manned Suborbital Space Flight, July 21, 1961

N64-84681 58 pp
Avail GPO 1961

### Proceedings of the International Meteorological Satellite Workshop, November 13-22, 1961

NASA meteorological satellite program, Tiros satellites, cloud studies, NASA meteorological satellite plans for the future.

N62-11221 233 pp
Avail GPO 1962

### NASA Project Names

A listing of names and code words associated with NASA programs.

N62-11673 20 pp
Avail NTIS 1962

### Results of the First United States Manned Orbital Space Flight, February 20, 1962

N62-10229 204 pp
Avail GPO 1962

### U.S. Standard Atmosphere, 1962

Tables of atmospheric properties, systematic variations in the atmosphere, gravity, geopotential.

N63-13176 5 pp
Avail NTIS 1963

### The United States in Space

Activities in the United States space program.

N64-12818 227 pp
Avail NTIS 1963

### Proceedings of the Experimenters' Information Meeting on the Apollo Applications Program in Bioscience

*D. R. Beem, S. J. Gerathewohl*

N66-31806 137 pp
Avail NTIS 1966

### U.S. Standard Atmosphere Supplements, 1966

Tables and models depicting conditions other than mid-latitude mean.

N67-37900 304 pp
Avail NTIS 1966

### Short Glossary of Space Terms

Glossary of technical terms in frequent use by aerospace technologists.

NASA SP-1
N66-25785 55 pp
Avail NTIS 1962

### Proceedings of the Second Image Intensifier Symposium

Advances in science, technology, and application of image tubes. Symposium, October 1961.

NASA SP-2
N62-14873 252 pp
Avail NTIS 1961

### List of Selected References on NASA Programs

Technical reports, technical notes, technical translations, journal articles, speeches, Congressional documents.

NASA SP-3
N62-14103 263 pp
Avail NTIS 1962

### NASA Day, April 27, 1962: Western Space Age Industries and Engineering Exposition and Conference

Space science, applications, tracking and data acquisition.

NASA SP-4
N62-14863 66 pp
Avail NTIS 1962

### Space Scientists and Engineers: Selected Biographical and Bibliographical Listing, 1957-1961

NASA SP-5
N63-90035 336 pp
Avail NTIS 1962

### Results of the Second United States Manned Orbital Space Flight, May 24, 1962

Spacecraft and launch systems, modified Mercury network, space phenomena, medical aspects.

NASA SP-6
N62-14691 107 pp
Avail NTIS 1962

### Dictionary of Technical Terms for Aerospace Use

*W. H. Allen*

NASA SP-7
N66-10413 310 pp
Avail NTIS 1965

### Proceedings of the Second National Conference on the Peaceful Uses of Space

Mercury, Apollo, Gemini projects; meteorological and communication satellites. Conference, May 1962.

NASA SP-8
N63-11137 272 pp
Avail GPO 1962

### Index of NASA Technical Publications With Abstracts

July 1960 to December 1961.

NASA SP-9
N63-90006 432 pp
Avail NTIS 1961

### Launch Vehicles of the National Launch Vehicle Program

*J. E. Webb*

Technical descriptions of Scout, Delta, Titan, Atlas, Thor-Agena, Centaur, Saturn, advanced Saturn, and Nova launch vehicles.

NASA SP-10
N63-10712 34 pp
Avail NTIS 1962

### Proceedings of the NASA-University Conference on the Science and Technology of Space Exploration

*H. R. Anderson, W. R. Bandeen, G. W. Beadle, et al.*

Rockets, geophysics, astronomy, celestial mechanics, bioastronautics. Conference, November 1962.

NASA SP-11
N63-11501 412 pp
Avail GPO 1962

### Results of the Third U.S. Manned Orbital Space Flight, October 3, 1962

Spacecraft and launch vehicle performance, aeromedical analysis, pilot's flight report.

NASA SP-12
N63-11990 122 pp
Avail GPO 1962

### Geophysics and Astronomy in Space Exploration

*R. E. Bourdeau, J. K. Kupperian, Jr., G. H. Ludwig, et al.*

Sounding rockets, space flight ionosphere studies, particles and fields research in space, astronomical research in space, aeronomy research.

NASA SP-13
N63-11503 45 pp
Avail NTIS 1962

### Lunar and Planetary Sciences in Space Exploration

*H. R. Anderson, J. E. Conel, M. Eimer, et al.*

Radar astronomy, exploration of deep space, interplanetary space physics, astrophysics, geological exploration of the Moon and planets.

NASA SP-14
N63-11504 84 pp
Avail NTIS 1962

### Celestial Mechanics and Space Flight Analysis

*C. R. Gates, T. W. Hamilton, W. M. Kaula, et al.*

Computer techniques, satellite orbits, spacecraft flight, space flight optimization.

NASA SP-15
N63-11505 42 pp
Avail NTIS 1962

### Data Acquisition From Spacecraft

*W. R. Bandeen, A. G. Ferris, C. C. Kirsten, et al.*

Role of data processing in orbit determination, scientific and meteorological satellites, data acquisition at planetary ranges.

NASA SP-16
N63-11506 58 pp
Avail NTIS 1962

### Control, Guidance, and Navigation of Spacecraft

*J. C. Bird, B. F. Doolin, J. V. Foster, et al.*

Space rendezvous, atmosphere entry, space vehicle attitude control.

NASA SP-17
N63-11507 56 pp
Avail NTIS 1962



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## Bioastronautics

*S. J. Gerathewohl, B. E. Gernandt, R. S. Johnston, et al.*

Bioengineering, exobiology, environmental biology, physiological and behavioral sciences.

NASA SP-18
N63-11508 36 pp
Avail NTIS 1962

## Chemical Rocket Propulsion

*C. L. Ball, M. J. Hartmann, E. R. Jonash, et al.*

Physics of liquid propellants, pumps, turbines, chemical rockets, research on rocket combustion and thrust chambers.

NASA SP-19
N63-11509 55 pp
Avail NTIS 1962

## Nuclear Rocket Propulsion

*D. Bogart, H. H. Ellerbrock, D. S. Gabriel, et al.*

Fluid flow, heat transfer, reactors, dynamics and control of nuclear rockets.

NASA SP-20
N63-11510 62 pp
Avail NTIS 1962

## Power for Spacecraft

*C. A. Barrett, D. T. Bernatowicz, T. P. Moffitt, et al.*

Interrelation of power requirements, energy sources, conversion techniques.

NASA SP-21
N63-11511 27 pp
Avail NTIS 1962

## Electric Propulsion for Spacecraft

*E. E. Callaghan, J. R. Jack, S. Lieblein, et al.*

Power generation systems, electrothermal thrusters.

NASA SP-22
N63-11512 57 pp
Avail NTIS 1962

## Aerodynamics of Space Vehicles

*M. H. Bertram, R. W. Boswinkle, Jr., J. P. Campbell, et al.*

Launch vehicles, space vehicle landing, hypersonic cruising, advanced reentry vehicles.

NASA SP-23
N63-11513 57 pp
Avail NTIS 1962

## Gas Dynamics in Space Exploration

*H. J. Allen, T. N. Canning, G. Goodwin, et al.*

Hypersonic flow fields, gases at hypervelocities.

NASA SP-24
N63-11514 52 pp
Avail NTIS 1962

## Plasma Physics and Magnetohydrodynamics in Space Exploration

*A. Busemann, M. C. Ellis, Jr., R. V. Hess, et al.*

Drag forces in the Earth's upper atmosphere, plasma frequency and radio attenuation, plasma accelerator research.

NASA SP-25
N63-11515 78 pp
Avail NTIS 1962

## Laboratory Techniques in Space Environment Research

*D. D. Elleman, F. B. Humphrey, H. E. Martens, et al.*

High-vacuum research techniques, modern magnetism, magnetic field generation.

NASA SP-26
N63-11516 52 pp
Avail NTIS 1962

## Materials for Space Operations

*D. D. Davis, Jr., R. H. Kemp, G. F. Pezdirtz, et al.*

Nonmetallic materials for spacecraft, ablation materials for atmospheric entry, flow and fracture problems, high-strength materials research.

NASA SP-27
N63-11517 47 pp
Avail NTIS 1962

## Structures for Space Operations

*R. A. Anderson, G. W. Brooks, R. W. Leonard, et al.*

Winged vehicle and planetary entry vehicle configuration and design.

NASA SP-28
N63-11518 48 pp
Avail NTIS 1962



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### Proceedings of the Second NASA–Industry Program Plans Conference

*W. L. Lingle, Jr.,*

NASA missions, future trends, space sciences program, lunar and planetary programs, biological problems related to space, launch vehicles and propulsion, meteorological and communication systems. Conference, February 1963.

NASA SP-29
N63-15357 221 pp
Avail GPO 1963

### The Observatory Generation of Satellites

Orbiting solar, geophysical, and astronomical observations. Symposium, December 1962.

NASA SP-30
N63-15166 62 pp
Avail GPO 1963

### Measurement of Thermal Radiation Properties of Solids

*J. C. Richmond*

Measurement of thermal radiation properties of solids over a wide range of temperatures; emittance studies. Symposium, September 1962.

NASA SP-31
N64-10937 596 pp
Avail GPO 1963

### Telstar I

Volume 1. Design, construction, ground facilities uses.

NASA SP-32
N64-10868 400 pp
Avail NTIS 1963

Volume 2. Antennas, results of Telstar tests and experiments.

NASA SP-32
N64-10882 525 pp
Avail NTIS 1963

Volume 3. Components and systems.

NASA SP-32
N64-11079 283 pp
Avail NTIS 1963

Volume 4. Operations, characteristics, performance.

NASA SP-32
N67-12301 448 pp
Avail NTIS 1965

### Space Flight Handbooks. Volume 1: Orbital Flight Handbook

*D. Kraft, G. Townsend*

Part 1. Basic Techniques and Data

NASA SP-33
N63-21101 523 pp
Avail NTIS 1963

### Space Flight Handbooks. Volume I: Orbital Flight Handbook (cont.)

Part 2. Mission Sequencing Problems

NASA SP-33
N63-21102 443 pp
Avail NTIS 1963

Part 3. Requirements

NASA SP-33
N63-21103 384 pp
Avail NTIS 1963

### Space Flight Handbooks. Volume II: Lunar Flight Handbook

*F. Martikan, F. Santora*

Part 1. Background Material

NASA SP-34
N63-21104 143 pp
Avail NTIS 1963

Part 2. Lunar Mission Phases

NASA SP-34
N63-21105 444 pp
Avail NTIS 1963

Part 3. Mission Planning

NASA SP-34
N63-21106 156 pp
Avail NTIS 1963

### Space Flight Handbooks. Volume III: Planetary Flight Handbook

*S. Ross*

Part 1. Speed Contours and Auxiliary Graphs for Manned Missions to Mars and Venus

NASA SP-35
N64-14175 280 pp
Avail NTIS 1963

Part 2. Supplementary Trajectory Data: Earth to Venus and Earth to Mars

NASA SP-35
N64-14176 522 pp
Avail NTIS 1963

Part 3. Supplementary Trajectory Data: Venus to Earth and Mars to Earth

NASA SP-35
N64-14177 530 pp
Avail NTIS 1963

Part 5. Trajectories to Jupiter, Ceres, and Vesta

NASA SP-35
N66-21045 541 pp
Avail NTIS 1966

Part 6. Mars Stopover Missions Using Venus Swingbys

NASA SP-35
N68-30098 98 pp
Avail NTIS 1968

Part 7. Direct Trajectories to Jupiter, Saturn, Uranus, and Neptune

NASA SP-35
N69-33490 105 pp
Avail GPO 1969

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**Space Flight Handbooks. Volume III: Planetary Flight Handbook (cont.)**

Part 8. Jupiter Swingby Missions to Saturn, Uranus, Neptune, and Pluto

NASA SP-35
N69-34850 131 pp
Avail GPO 1969

Part 9. Direct and Venus Swingby Trajectories

NASA SP-35
N70-28534 238 pp
Avail GPO 1970

**Aerodynamic Design of Axial-Flow Compressors**

*R. O. Bullock, I. A. Johnsen*

Aerodynamic systems design of axial flow compressors.

NASA SP-36
N65-23345 524 pp
Avail NTIS 1965

**Conference on Space, Science, and Urban Life**

*W. E. Thompson*

Use of space age science and technology to solve socioeconomic problems of metropolitan areas resulting from industrial growth. Conference, March 1963.

NASA SP-37
N64-11502 265 pp
Avail GPO 1963

**Advanced Bearing Technology**

*W. J. Anderson, E. E. Bisson*

Fundamentals of friction and wear on fluid film and rolling-element bearings.

NASA SP-38
N64-15226 517 pp
Avail GPO 1964

**Results of the Project Mercury Ballistic and Orbital Chimpanzee Flights**

*J. P. Henry, J. D. Mosely*

NASA SP-39
N64-12915 77 pp
Avail GPO 1963

**Proceedings of the Conference on Space-Age Planning**

Space-age planning and the peaceful uses of space. Conference, May 1963.

NASA SP-40
N63-21126 272 pp
Avail GPO 1963

**Proceedings of the NASA-AEC Liquid-Metals Corrosion Meeting, Volume 1**

Liquid metal corrosion processes.

NASA SP-41
N64-20783 292 pp
Avail NTIS 1964

**Proceedings of the NASA-AEC Liquid-Metals Corrosion Meeting, Volume 2**

NASA SP-42
N73-70372 54 pp
Avail NTIS 1963

**Ariel I: The First International Satellite**

*R. C. Baumann*

Development of Ariel I ionosphere satellite.

NASA SP-43
N64-10332 84 pp
Avail NTIS 1963

**Proceedings of the Conference on the Law of Space and of Satellite Communications**

Space law and communications satellites, free space lower boundary, control of space, orbital regulation, and international cooperation. Conference, May 1963.

NASA SP-44
N64-21136 212 pp
Avail GPO 1964

**Mercury Project Summary, Including Results of the Fourth Manned Orbital Flight, May 15-16, 1963**

Space vehicle development, mission support, flight operations, mission results.

NASA SP-45
N63-21951 435 pp
Avail GPO 1963

**Physics of Nonthermal Radio Sources**

*A. G. W. Cameron, S. P. Maran*

Spectra, polarization, and optical properties of galactic and extragalactic light sources. Conference, December 1962.

NASA SP-46
N65-13251 159 pp
Avail NTIS 1964

**Space Cabin Atmospheres. Part I: Oxygen Toxicity**

*E. M. Roth*

High oxygen tension in animals and humans, oxygen toxicity, and drug therapy.

NASA SP-47
N64-31219 59 pp
Avail GPO 1964

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### Space Cabin Atmospheres. Part II: Fire and Blast Hazards

*E. M. Roth*

Fire and blast hazards in space cabin atmospheres.

NASA SP-48
N64-20744 126 pp
Avail GPO 1964

### Meteorological Observations Above 30 Kilometers

Meteorological rocket soundings in stratosphere and mesosphere. Conference, July 1963.

NASA SP-49
N64-23869 61 pp
Avail GPO 1964

### AAS-NASA Symposium on the Physics of Solar Flares

*W. N. Hess*

Spectrographic and magnetic observations of flares, x-ray and gamma ray bursts, radio bursts, energetic particles, theory of flares. Symposium, October 1963.

NASA SP-50
N64-30251 433 pp
Avail GPO 1964

### Proceedings of the Fourth National Conference on the Peaceful Uses of Space

Exploration of space, discoveries from space exploration, uses of weather and communication satellites. Conference, April 1964.

NASA SP-51
N64-30326 205 pp
Avail GPO 1964

### Proceedings of the NASA Conference on Communicating Through Plasmas of Atmospheric Entry and Rocket Exhaust

Reentry communication problems, studies using simulated reentry plasma, flight experiments. Conference, January 1964.

NASA SP-52
N71-70451 231 pp
Avail NTIS 1964

### A Quasi-Global Presentation of Tiros III Radiation Data

*L. J. Allison, T. I. Gray, Jr., G. Warnecke*

Tiros III worldwide radiation map, synoptic application of infrared data.

NASA SP-53
N65-10301 16 pp
Avail GPO 1964

### Scientific Findings From Explorer VI

*H. E. Newell*

Scientific data acquired by Explorer satellite measurements; astronomy and celestial mechanics, ionospheric physics, and energetic particles in Van Allen belt and magnetic fields.

NASA SP-54
N65-21965 377 pp
Avail NTIS 1965

### Symposium on Thermal Radiation of Solids

*S. Katzoff*

Fundamentals, surface effects, measurement techniques, space environment effects, and applications of thermal radiation of solids. Conference, March 1964.

NASA SP-55
N65-26855 590 pp
Avail NTIS 1965

### Concepts for Detection of Extraterrestrial Life

*F. H. Quimby*

NASA SP-56
N65-12268 52 pp
Avail NTIS 1964

### Orbiting Solar Observatory Satellite OSO-1: The Project Summary

OSO-1 spacecraft dynamics, structural design and fabrication, control systems, data acquisition and command system, power supply, thermal control, experiments, and test program.

NASA SP-57
N66-29482 308 pp
Avail NTIS 1965

### Effect of Ionizing Radiation on a Series of Saturated Polyesters

*G. F. Dalelio, R. Haberli, G. F. Pezdirtz*

NASA SP-58
N65-11059 68 pp
Avail NTIS 1964

### Mariner-Venus 1962: Final Project Report

Project organization and management, space vehicle system, trajectory and orbit, tracking and data acquisition, scientific results.

NASA SP-59
N66-14702 380 pp
Avail NTIS 1965

**X-15 Research Results, With a Selected Bibliography**

*W. H. Stillwell*

X-15 aircraft development concept, flight research, aerodynamic characteristics of supersonic-hypersonic flight, hypersonic structure, flying laboratory, and bibliography.

NASA SP-60
N65-20162 135 pp
Avail NTIS 1965

**Ranger VII Photographs of the Moon. Part I: Camera "A" Series**

Lunar surface closeup pictures.

NASA SP-61
N64-31723 226 pp
Avail GPO 1964

**Ranger VII Photographs of the Moon. Part II: Camera "B" Series**

NASA SP-62
N65-17866 226 pp
Avail GPO 1965

**Ranger VII Photographs of the Moon. Part III: Camera "P" Series**

Lunar photographs taken by four partial-scan cameras aboard Ranger VII.

NASA SP-63
N65-33848 235 pp
Avail NTIS 1965

**Progress in Development of Methods in Bone Densitometry**

*D. W. Jenkins, W. F. Neumann, G. D. Whedon*

Determining thickness and mineral content in vertebra and other bones by x-ray and other densitometry, application of techniques to human studies. Conference, March 1965.

NASA SP-64
N66-17666 199 pp
Avail NTIS 1966

**Space Technology. Volume I: Spacecraft Systems**

*L. H. Abraham*

Spacecraft systems, aerodynamics, power plants, loads, propellant tank design.

NASA SP-65
N65-24625 82 pp
Avail NTIS 1965

**Space Technology. Volume II: Spacecraft Mechanical Engineering**

*J. L. Adams*

Spacecraft design and mechanical engineering.

NASA SP-66
N65-24626 169 pp
Avail NTIS 1965

**Space Technology. Volume IV: Spacecraft Guidance and Control**

*J. R. Scull*

Spacecraft control, navigation, and guidance.

NASA SP-68
N67-16059 140 pp
Avail NTIS 1966

**Space Technology. Volume V: Telecommunications**

*J. J. Stiffler*

Improved data handling and pulse modulation systems for space telecommunication.

NASA SP-69
N67-16555 148 pp
Avail NTIS 1966

**Proceedings of the Conference on Space Nutrition and Related Waste Problems**

*T. C. Helvey*

Conference, April 1964.

NASA SP-70
N65-18566 408 pp
Avail NTIS 1964

**Proceedings of Second Symposium on Protection Against Radiation in Space**

*A. Reetz, Jr.*

Symposium, October 1964.

NASA SP-71
N65-34575 519 pp
Avail NTIS 1965

**Symposium on the Analysis of Central Nervous System and Cardiovascular Data Using Computer Methods**

*W. R. Adey, L. D. Proctor*

Symposium, October 1964.

NASA SP-72
N65-28750 492 pp
Avail NTIS 1965

**The Nature and Scope of the NASA University Program**

*T. L. K. Smull*

NASA SP-73
N65-28332 41 pp
Avail NTIS 1965

**Survey of the Literature of the Solar Constant and the Spectral Distribution of Solar Radiant Flux**

*M. P. Thekaekara*

Solar constant, spectral distribution of solar radiant flux, solar radiation laws and simulation, spacecraft thermal balance, and radiation measurement scale.

NASA SP-74
N65-22362 47 pp
Avail NTIS 1965


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### An Analysis of the Extraterrestrial Life Detection Problem

*R. D. Johnson, R. B. Painter, R. S. Young*

NASA SP-75
N65-34227 36 pp
Avail NTIS 1965

### Final Report on the Relay I Program

Relay I satellite program to carry out communications experiments with spacecraft, to detect radiation particles in Van Allen belt, and to determine radiation damage to components.

NASA SP-76
N66-10226 749 pp
Avail NTIS 1965

### First Conference on the Role of the Vestibular Organs in the Exploration of Space

Role of vestibular apparatus, semicircular canals, and otolith organs in space explorations. Symposium, January 1965.

NASA SP-77
N66-16106 376 pp
Avail NTIS 1965

### The Meteoroid Environment and Its Effects on Materials and Equipment

*W. A. Cosby, R. G. Lyle*

Hypervelocity impact phenomena.

NASA SP-78
N66-14158 119 pp
Avail NTIS 1965

### Electrical Power Generation Systems for Space Applications

Current and predicted state of the art of solar, chemical, and nuclear systems.

NASA SP-79
N65-25272 42 pp
Avail NTIS 1965

### Short-Term Frequency Stability

Panel discussion on frequency stability measurement techniques. Symposium, November 1964.

NASA SP-80
N66-10381 296 pp
Avail NTIS 1965

### Summary Report on the NASA University Program Review Conference

*D. J. Montgomery*

Nature, conduct, results, and impact of the program. Conference, March 1965.

NASA SP-81
N65-28249 42 pp
Avail NTIS 1965

### Proceedings of the Fifth National Conference on the Peaceful Uses of Space

Space research impact on national economy and industry, communications, education, and science and technology. Conference, May 1965.

NASA SP-82
N66-30366 212 pp
Avail NTIS 1966

### Conference on Aircraft Operating Problems

Conference on aircraft operational problems of general, supersonic, V/STOL and STOL aircraft. May 1965.

NASA SP-83
N65-31100 335 pp
Avail NTIS 1965

### Bioenergetics of Space Suits for Lunar Exploration

*E. M. Roth*

Literature review.

NASA SP-84
N66-27235 145 pp
Avail NTIS 1966

### NASA University Program Review Conference

Training, research, space flight, technology, facilities, and experimentation. Conference, March 1965.

NASA SP-85
N66-12401 375 pp
Avail NTIS 1965

### Medical Aspects of an Orbiting Research Laboratory

*S. P. Vinograd*

Life support system recommendations, human reaction to medical experiments for orbital research laboratory. Space Medicine Advisory Group Study, August 1964.

NASA SP-86
N66-33199 152 pp
Avail NTIS 1966

### Proceedings of the Apollo Unified S-Band Technical Conference

Tracking and communications system for Apollo spacecraft at lunar distances using S-band. Conference, July 1965.

NASA SP-87
N65-35476 277 pp
Avail NTIS 1965

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### NASA 1965 Summer Conference on Lunar Exploration and Science

Overall program for lunar exploration missions, role of various scientific disciplines in early Apollo missions, manned lunar orbiter and surface expeditions, post-Apollo programs. Conference, July 1965.

NASA SP-88
N66-14826 448 pp
Avail NTIS 1965

### Observations From the Nimbus I Meteorological Satellite

NASA SP-89
N66-12130 92 pp
Avail NTIS 1965

### Progress of the X-15 Research Airplane Program

Conference, October 1965.

NASA SP-90
N73-71303 133 pp
Avail NTIS 1965

### Significant Achievements in Space Astronomy, 1958–1964

Space astronomy developments in x-ray, gamma-ray, ultraviolet, infrared, and low-frequency radio spectra.

NASA SP-91
N66-34786 71 pp
Avail NTIS 1966

### Significant Achievements in Space Bioscience, 1958–1964

Research in exobiology, environmental biology, behavioral biology, molecular biology and bioinstrumentation, space flight programs, and manned space flight.

NASA SP-92
N66-17778 142 pp
Avail NTIS 1966

### Significiant Achievements in Space Communications and Navigation, 1958–1964

Reasons for and advantages of communications and navigation satellites.

NASA SP-93
N66-18458 73 pp
Avail NTIS 1966

### Significant Achievements in Satellite Geodosy, 1958–1964

Satellite observations in geodetic surveying.

NASA SP-94
N66-37346 178 pp
Avail NTIS 1966

### Significant Achievements in Ionospheres and Radio Physics, 1958–1964

*E. R. Schmerling*

NASA SP-95
N66-22936 68 pp
Avail NTIS 1966

### Significant Achievements in Satellite Meteorology, 1958–1964

Meteorological satellite and sounding rocket configurations and instrumentation, cloud photography, radiometry, data acquisition and processing.

NASA SP-96
N66-19523 148 pp
Avail NTIS 1966

### Significant Achievements in Particles and Fields, 1958–1964

Explorer satellite and Mariner space probe data on solar wind, radiation belts, trapped particles, geomagnetic field, cosmic rays, and neutrons.

NASA SP-97
N66-19524 99 pp
Avail NTIS 1966

### Significant Achievements in Planetary Atmospheres, 1958–1964

Planetary and Earth atmospheric composition, temperature, and activity data from satellites and sounding rockets.

NASA SP-98
N66-19525 65 pp
Avail NTIS 1966

### Significant Achievements in Planetology, 1958–1964

Terrestrial observations of lunar and planetary electromagnetic radiation and chemical-mineralogical composition, and space probe data and instrumentation.

NASA SP-99
N66-23475 81 pp
Avail NTIS 1964

### Significant Achievements in Solar Physics, 1958–1964

Solar soft x-ray and ultraviolet mapping, hard x-ray emission, corona, satellite monitored radiation, and instrumentation study summaries for solar physics.

NASA SP-100
N66-25003 106 pp
Avail NTIS 1966



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### Conference on Langley Research Related to Apollo Mission

Heating and thermal protection, landing dynamics, spacecraft simulation. Conference, June 1965.

NASA SP-101
N72-71553 413 pp
Avail NTIS 1965

### Philosophy of Simulation in a Man-Machine Space Mission System

*T. M. Fraser*

Nature of simulation; prerequisites for simulation; fidelity, realism, and transfer of training; use of manned simulators.

NASA SP-102
N66-27236 116 pp
Avail NTIS 1966

### Human Responses to Sustained Acceleration

*T. M. Fraser*

Review and bibliography of human response to sustained acceleration.

NASA SP-103
N66-27319 137 pp
Avail NTIS 1966

### Proceedings of a Conference on Theoretical Biology

*G. J. Jacobs*

Cell synthesis and ecology. Conference, November 1963.

NASA SP-104
N66-30395 211 pp
Avail NTIS 1966

### Vacuum Technology and Space Simulation

*D. H. Holkeboer, D. W. Jones, F. Pagano, et al.*

Nomenclature, pressure, pressure gauges, pumping speed and systems, cryogenic pumping, gas load, outgassing of materials, leak detection, gas flow in components and systems, space simulation and vacuum systems.

NASA SP-105
N66-36129 331 pp
Avail GPO 1966

### The Dynamic Behavior of Liquids in Moving Containers

*H. N. Abramson*

Dynamic behavior of liquids in moving containers with applications to propellants in space vehicle fuel tanks.

NASA SP-106
N67-15884 479 pp
Avail NTIS 1966

### Proceedings of a Symposium on Passive Gravity-Gradient Stabilization

Passive gravity-gradient stabilization systems for satellites. Symposium, May 1965.

NASA SP-107
N66-36326 291 pp
Avail NTIS 1966

### Spacecraft Sterilization Technology

Spacecraft sterilization requirements, microbiological contamination control, sterilization techniques. Conference, November 1965.

NASA SP-108
N67-14761 601 pp
Avail NTIS 1966

### Development of Small Animal Payload and Integration with a Sounding Rocket

*L. J. Early*

NASA SP-109
N66-33540 110 pp
Avail NTIS 1966

### Involuntary Hypohydration in Man and Animals: A Review

*J. E. Greenleaf*

NASA SP-110
N66-23622 38 pp
Avail NTIS 1966

### Ranger VIII Photographs of the Moon: Cameras "A," "B," and "P"

Lunar photographs taken by Ranger VIII and photograhic data tables.

NASA SP-111
N66-25366 478 pp
Avail GPO 1966

### Ranger IX Photographs of the Moon: Cameras "A," "B," and "P"

Ranger IX photographs of crater Alphonsus on lunar surface.

NASA SP-112
N66-26555 193 pp
Avail NTIS 1966

### Dynamic Stability of Rotor-Bearing Systems

*E. J. Gunter, Jr.*

NASA SP-113
N67-11942 234 pp
Avail NTIS 1966

DOCUMENT AVAILABLE

### Space Technology. Volume VI: Space Sciences

*T. A. Farley*

Geomagnetism, solar and galactic cosmic rays, comets, influence on Earth environment.

NASA SP-114
N67-18141 90 pp
Avail NTIS 1966

### Second Symposium on the Role of the Vestibular Organs in Space Exploration

Vestibular changes, human equilibrium and orientation, adaptation of gravitoinertial receptor mechanisms during space missions. Symposium, January 1966.

NASA SP-115
N67-15121 315 pp
Avail NTIS 1966

### Conference on V/STOL and STOL Aircraft

Aerodynamic and performance characteristics, handling qualities, and propulsion systems for STOL, VTOL, and V/STOL aircraft. Conference, April 1966.

NASA SP-116
N66-24606 461 pp
Avail NTIS 1966

### Space Cabin Atmospheres. Part III: Physiological Factors of Inert Gases

*E. M. Roth*

NASA SP-117
N67-22878 135 pp
Avail NTIS 1967

### Space Cabin Atmospheres. Part IV: One- Versus Multiple-Gas Systems

*E. M. Roth*

Physiological factors, hardware, and environmental control tradeoffs for one and two gas systems of space cabin atmospheres.

NASA SP-118
N67-29998 138 pp
Avail NTIS 1967

### Ariel I: The First International Satellite. Experimental Results

Structural design, experimental data, tracking.

NASA SP-119
N67-16514 163 pp
Avail NTIS 1966

### Fuel Cells

*L. G. Austin*

Review of government-sponsored fuel cell research, 1950–1964.

NASA SP-120
N67-40137 451 pp
Avail NTIS 1967

### Gemini Midprogram Conference

Spacecraft and launch vehicle development and performance, flight operations, mission results, physical science and biomedical experiments. Conference, February 1966.

NASA SP-121
N66-29626 417 pp
Avail NTIS 1966

### Summary Report on the NASA-Western University Conference

*D. E. Cunningham*

Conference, November 1965.

NASA SP-122
N67-11943 55 pp
Avail NTIS 1966

### Nuclear Rocket Technology Conference

Graphite nuclear rocket and tungsten water-moderated nuclear rocket. Conference, April 1966.

NASA SP-123
N73-70969 325 pp
Avail NTIS 1966

### Conference on Aircraft Aerodynamics

Experimental techniques; stability and control; propulsion aerodynamics; subsonic, supersonic, and transonic aerodynamics. Conference, May 1966.

NASA SP-124
N75-71754 611 pp
Avail NTIS 1966

### Design of Liquid Propellant Rocket Engines

*D. H. Huang, D. K. Huzel*

Parameters for design of rocket engines and systems.

NASA SP-125
N71-29405 461 pp
Avail NTIS 1971

### Surveyor I: A Preliminary Report

Surveyor I preliminary data on lunar surface mechanical, thermal, and electrical properties, topography, and geology.

NASA SP-126
N66-29481 50 pp
Avail NTIS 1966

### Astronomy in Space

*G. E. Mueller, H. E. Newell, N. G. Roman, et al.*

NASA space science astronomy program: orbiting satellite experiments for solar, stellar, and galactic observations.

NASA SP-127
N67-18730 67 pp
Avail NTIS 1967

### Second Annual NASA-University Conference on Manual Control

Discrete and continuous models, multivariable and adaptive control, information theory, design methods. Conference, March 1966.

NASA SP-128
N67-15850 422 pp
Avail NTIS 1966

### Earth Photographs From Gemini III, IV, and V

Earth color photographs from Gemini III, IV, and V indicating terrain features and cloud systems.

NASA SP-129
N67-26641 262 pp
Avail GPO 1967

### A Review of the Mariner IV Results

*O. W. Nicks*

Data on Mars, solar system, and interplanetary space flight.

NASA SP-130
N67-31356 42 pp
Avail NTIS 1967

### Space Power Systems Advanced Technology Conference

Chemical and nuclear power, reactor heat sources, and power conversion. Conference, August 1966.

NASA SP-131
N67-10261 295 pp
Avail NTIS 1966

### Aerospace Measurement Techniques

*G. G. Mannella*

Advanced aerospace technology measurement techniques and instrumentation. Symposium, July 1966.

NASA SP-132
N67-17781 280 pp
Avail NTIS 1967

### Scientific Satellites

Equipment, instrumentation, communications, design, launch vehicles, and guidance of scientific satellites.

NASA SP-133
N68-14965 828 pp
Avail GPO 1967

### Conference on the Closed Life Support System

Water purification, waste disposal, and food synthesis for space flights. Conference, April 1966.

NASA SP-134
N67-34583 231 pp
Avail NTIS 1967

### Meteor Orbits and Dust: Proceedings of a Symposium

*G. S. Hawkins*

Concentrations and orbital calculations of meteors and meteoritic and extraterrestrial dust particles. Symposium, August 1965.

NASA SP-135
N67-32038 437 pp
Avail NTIS 1967

### Significant Achievements in Space Science, 1965

*H. E. Newell*

NASA SP-136
N67-19022 222 pp
Avail NTIS 1967

### Significant Achievements in Space Applications, 1965

Space satellite application in communications, navigation, geodesy, and meteorology.

NASA SP-137
N67-18724 91 pp
Avail NTIS 1966

### Gemini Summary Conference

Rendezvous, docking, extravehicular activity, experiment results. Conference, February 1967.

NASA SP-138
N68-14941 335 pp
Avail NTIS 1967

### Mariner-Mars 1964: Final Project Report

Mariner-Mars 1964 mission accomplishments.

NASA SP-139
N68-18743 356 pp
Avail NTIS 1967

### Interstellar Grains

*J. M. Greenberg, T. P. Roark*

Observational and theoretical interpretations of interstellar grains. Conference, August 1965.

NASA SP-140
N68-11456 275 pp
Avail GPO 1967

### First Compilation of Papers on Trajectory Analysis and Guidance Theory

Mathematical models to approximate functions, bounds and power series for three-body problems, satellite orbit theories, and other aspects of trajectory analysis and guidance theory.

NASA SP-141
N67-29370 227 pp
Avail NTIS 1967

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### A Survey of Space Applications

NASA program for application of space science and technology to public sector.

NASA SP-142
N67-23338 140 pp
Avail GPO 1967

### Oxide Dispersion Strengthened Alloys

*N. J. Grant, R. W. Hall, H. J. Siegel*

State-of-the-art survey on oxide dispersion strengthened alloys for use as high temperature materials.

NASA SP-143
N67-37477 30 pp
Avail NTIS 1967

### Third Annual NASA-University Conference on Manual Control

Display devices, function models, decision processes, physiological modeling, computer processing of manual control records. Conference, March 1967.

NASA SP-144
N68-15901 435 pp
Avail NTIS 1967

### A Survey of Attitude Sensors for Spacecraft

*N. M. Hatcher*

Spacecraft attitude sensors design and operational features, horizon scanners, solar sensors, star trackers, space sextants, and map matchers.

NASA SP-145
N67-31296 21 pp
Avail NTIS 1967

### Surveyor III: A Preliminary Report

Preliminary observations from Surveyor III soft Moon landing, telemetered pictures and data on mechanical soil sampler, lunar surface properties.

NASA SP-146
N67-32582 170 pp
Avail NTIS 1967

### Sonic Boom Research

*A. R. Seebass*

Conference, April 1967.

NASA SP-147
N68-21413 115 pp
Avail NTIS 1967

### Conference on Hypersonic Aircraft Technology

Mission studies, configuration aerodynamics, hypersonic viscous flow, propulsion, structures and materials. Conference, May 1967.

NASA SP-148
N74-73049 591 pp
Avail NTIS 1967

### Summary of Gemini Extravehicular Activity

*R. M. Machell*

NASA SP-149
N68-15891 336 pp
Avail NTIS 1967

### The Zodiacal Light and the Interplanetary Medium

*J. L. Weinberg*

Photometric and meteor observations, scattering properties, particle collection and impact, solar wind, and origin and evolution of zodiacal light in interplanetary medium. Conference, February 1967.

NASA SP-150
N68-27475 395 pp
Avail NTIS 1967

### Relay Program Final Report

Summary of operation, communications, and other experiments of Relay II satellite.

NASA SP-151
N69-21065 368 pp
Avail GPO 1968

### Third Symposium on the Role of the Vestibular Organs in Space Exploration

Symposium, January 1967.

NASA SP-152
N68-29128 437 pp
Avail NTIS 1968

### Symposium on Computer Simulation of Plasma and Many-Body Problems

Plasma physics, Vlasov theory, astrophysics, magnetohydrodynamics, many-body problems, and computer simulation. Symposium, April 1967.

NASA SP-153
N67-37737 465 pp
Avail NTIS 1967

### Aerospace Electronic Systems Technology: A Briefing for Industry

Conference, May 1967.

NASA SP-154
N68-33169 319 pp
Avail NTIS 1967

### Significant Achievements in Space Science, 1966

Advances in astronomy, exobiology, ionospheric sciences, radio and solar physics, planetary atmospheres, and planetology.

NASA SP-155
N68-15748 224 pp
Avail GPO 1967

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### Significant Achievements in Space Applications, 1966

*R. H. McQuain*

Achievements of application technology satellites, communication satellites, navigation and traffic control satellite program, weather satellites, and satellite geodesy.

NASA SP-156
N68-16015 97 pp
Avail NTIS 1967

### 1967 Summer Study of Lunar Science and Exploration

*W. N. Hess*

Future of lunar manned and unmanned exploration and Apollo applications program.

NASA SP-157
N67-40564 405 pp
Avail NTIS 1967

### The Potential Applications of Satellite Geodetic Techniques to Geosciences

Potential applications of geodetic satellites to geology, oceanography, glaciology, and atmospheric physics.

NASA SP-158
N68-18902 26 pp
Avail NTIS 1968

### Recent Advances in Display Media

Properties and imaging techniques of various display devices: computer-directed visual flight control boards, integrated optical man-machine systems, and electro-optical methods. Symposium, September 1967.

NASA SP-159
N68-22302 129 pp
Avail NTIS 1968

### Vibration of Plates

*A. W. Leissa*

Tabulated numerical results of theories of plate vibration.

NASA SP-160
N70-18461 360 pp
Avail GPO 1969

### Biology of Hard Tissue: Proceedings of the Second Conference

*A. M. Budy*

Bone diseases and regeneration, cellular differentiation, and homeostasis of calcium. Conference, March 1966.

NASA SP-161
N69-10444 599 pp
Avail GPO 1968

### Objectives and Goals in Space Science and Applications, 1968

*J. E. Naugle*

Objectives, current programs, and future mission options in space sciences and applications.

NASA SP-162
N69-13844 97 pp
Avail GPO 1968

### Surveyor V: A Preliminary Report

Configuration, television picture transmission, and experiments on measuring chemical elements in lunar surface.

NASA SP-163
N68-17844 162 pp
Avail NTIS 1967

### Thermal Radiation Heat Transfer

*J. R. Howell, R. Siegel*

Volume I. The Blackbody, Electromagnetic Theory, and Material Properties

NASA SP-164
N68-28530 194 pp
Avail NTIS 1968

Volume II. Radiation Exchange Between Surfaces and in Enclosures

NASA SP-164
N69-30317 290 pp
Avail GPO 1969

Volume III. Radiation Transfer With Absorbing, Emitting, and Scattering Media

NASA SP-164
N71-30941 362 pp
Avail GPO 1971

### Bioregenerative Systems

Bioregenerative life support systems for long duration space flights; hydrogenomonas biosynthesis and algae photosynthesis processes. Conference, November 1966.

NASA SP-165
N68-26207 152 pp
Avail NTIS 1968

### Surveyor VI: A Preliminary Report

Surveyor VI scientific data analysis.

NASA SP-166
N68-21443 173 pp
Avail NTIS 1968

### Significant Achievements in Space Science, 1967

Stellar astronomy, bioscience, ionospheres, planetology, particles and fields, solar physics, and planetary atmospheres.

NASA SP-167
N69-25460 548 pp
Avail GPO 1968

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### Exploring Space With a Camera

*E. M. Cortright*

Spaceborne photography of cloud cover and other meteorological phenomena, Surveyor and Orbiter lunar shots, and Gemini space walk and target docking.

NASA SP-168
N68-34870 227 pp
Avail GPO 1968

### Protection Against Space Radiation

*K. Obrien, A. Reetz, Jr.*

Space radiation transport, spacecraft shielding design and advanced concepts, and methods for calculating radiation penetration through protective shields. Conference, June 1967.

NASA SP-169
N68-26128 627 pp
Avail NTIS 1968

### Numerical Analysis

*R. H. Wilson, Jr.*

Numerical analysis applications to aerospace and related problems. Conference, January 1968.

NASA SP-170
N68-33245 46 pp
Avail NTIS 1968

### Earth Photographs From Gemini VI Through XII

Color photographs of Earth taken during Gemini flights VI through XII.

NASA SP-171
N69-28909 335 pp
Avail GPO 1968

### Batteries for Space Power Systems

*P. Bauer*

NASA development work on high efficiency batteries for space electric power systems.

NASA SP-172
N69-18042 314 pp
Avail NTIS 1968

### Surveyor VII: A Preliminary Report

Principal scientific results on Surveyor VII lunar mission.

NASA SP-173
N68-33553 304 pp
Avail NTIS 1968

### Conference on Electromagnetic Exploration of the Moon: June 11-13, 1968. Report of the Program Evaluation Committee

Proposed electromagnetic exploration of Moon. Conference, June 1968.

NASA SP-174
N69-33595 27 pp
Avail NTIS 1969

### EXAMETNET Data Report Series Annual Report, 1966

Rocket sounding meteorological data of EXAMETNET for 1966.

NASA SP-175
N69-16214 190 pp
Avail NTIS 1968

### EXAMETNET Data Report Series Annual Report, 1967

EXAMETNET meteorological rocket launchings and data dissemination, with tables.

NASA SP-176
N69-22570 188 pp
Avail NTIS 1969

### Proceedings of the Working Group on Extraterrestrial Resources

Lunar environment, bases, exploration, and extraterrestrial resources. Conference, February 1968.

NASA SP-177
N69-22226 247 pp
Avail NTIS 1968

### Langley, Ames, Lewis, and Flight Research Center Support of DOD VFAX/FX Projects Progress Report

NASA SP-178 186 pp
X70-11968 1968

### The Book of Mars

*S. Glasstone*

Observations and theoretical studies of Mars properties.

NASA SP-179
N69-16571 307 pp
Avail GPO 1968

### Second Conference on Sonic Boom Research

*I. R. Schwartz*

Sonic boom reduction in supersonic transport flight. Shock wave propagation and refraction, prediction methods for acoustic attenuation, aerodynamic engineering aspects. Conference, May 1968.

NASA SP-180
N68-34907 218 pp
Avail NTIS 1968

### Interdisciplinary Approach to Friction and Wear

*P. M. Ku*

Structure, interactions, and topography of solid surfaces, sliding friction, adhesion, wear, and boundary lubrication. Conference, November 1967.

NASA SP-181
N69-36401 489 pp
Avail GPO 1968

### Problems and Programs on the Use of Submillimeter Waves in Space

*M. R. Nagel*

Uses of submillimeter waves in aerospace technology, with bibliography.

NASA SP-182
N68-35522 49 pp
Avail NTIS 1968

### Some Fluid Mechanical Problems Related to Subsonic and Supersonic Aircraft

*J. T. Howe*

NASA SP-183
N69-10693 24 pp
Avail NTIS 1968

### Surveyor: Program Results

Summary of lunar data and scientific observations generated by Surveyor landings on Moon.

NASA SP-184
N69-36451 432 pp
Avail GPO 1969

### A Study of NASA University Programs

NASA university programs in personnel training, aeronautics and space research, and laboratories and research centers.

NASA SP-185
N68-35564 85 pp
Avail NTIS 1968

### Theories of Equilibrium Figures of a Rotating Homogeneous Fluid Mass

*Y. Hagihara*

Theory of equilibrium figures of rotating, homogeneous, incompressible fluid mass as applied to cosmology.

NASA SP-186
N71-33591 174 pp
Avail GPO 1970

### Fourth Symposium on the Role of the Vestibular Organs in Space Exploration

Etiology, symptomatology, and treatment of motion sickness with respect to vestibular organ and related neurological functions. Symposium, September 1968.

NASA SP-187
N70-30699 393 pp
Avail GPO 1970

### $CO_2$: Chemical, Biological, and Physiological Aspects

*J. T. Edsall, R. E. Forster, A. B. Otis, et al.*

Molecular structure of carbonic anhydrase, enzymatic carboxylation, and respiratory gas exchange.

NASA SP-188
N70-23290 242 pp
Avail GPO 1969

### Progress of NASA Research Relating to Noise Alleviation of Large Subsonic Jet Aircraft

Nacelle acoustic linings, sound generation in jet engines, operational noise effects on humans. Conference, October 1968.

NASA SP-189
N69-11542 691 pp
Avail NTIS 1968

### Mariner-Venus, 1967: Final Project Report

Results and tracking and data acquisition for Mariner-Venus 1967 and Mariner-Venus 1967 extension projects.

NASA SP-190
N72-20809 310 pp
Avail GPO 1971

### Average Evoked Potentials: Methods, Results, and Evaluations

*E. Donchin, D. B. Lindsley*

Methods, results, and evaluation of research in average evoked potentials. Conference, September 1968.

NASA SP-191
N70-16876 410 pp
Avail GPO 1969

### Fourth Annual NASA-University Conference on Manual Control

Mathematical models of human performance in manual control of man-machine systems. Conference, March 1968.

NASA SP-192
N70-14876 573 pp
Avail NTIS 1969

### Evaluation of Motion-Degraded Images

Optical filters and digital methods for blurring removal from photographic imagery. Conference, December 1968.

NASA SP-193
N69-33822 178 pp
Avail GPO 1969

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### Liquid Propellant Rocket Combustion Instability

*D. T. Harrje*

Combustion instability in liquid propellant rocket engines.

NASA SP-194
N72-33729 659 pp
Avail GPO 1972

### Significant Accomplishments in Science: Goddard Space Flight Center, 1968

Investigation of Earth atmospheric composition, geomagnetism, extraterrestrial radiation, solar activity, and planetary atmospheres by satellite experiment and astronomical observations. Symposium, January 1969.

NASA SP-195
N69-38951 196 pp
Avail NTIS 1969

### NASA Science and Technology Advisory Committee for Manned Space Flight: Proceedings of the Winter Study on Uses of Manned Space Flight 1975-1985

Manned space flight capabilities for lunar and planetary explorations and Earth orbiting stations.

Volume I. Proceedings

NASA SP-196
N69-22510 45 pp
Avail NTIS 1969

Volume II. Appendixes

NASA SP-196
N70-17026 177 pp
Avail NTIS 1969

### Lunar Orbiter I, Preliminary Results: Lunar Terrain Assessment and Selenodesy, Micrometeoroid, and Radiation Data

*G. W. Brewer, J. K. Hughes*

Lunar Orbiter I terrain assessment photographs and preliminary selenodesy, micrometeoroid, and radiation data.

NASA SP-197
N69-39213 147 pp
Avail NTIS 1969

### Atlas of Cometary Forms: Structures Near the Nucleus

*B. Donn, J. Rahe, K. Wurm*

Atlas of drawings and photographs of comets.

NASA SP-198
N70-12260 135 pp
Avail GPO 1969

### Lectures in High-Energy Astrophysics

*H. B. Oegelmann, J. R. Wayland, Jr.*

High-energy cosmic radiation problems.

NASA SP-199
N69-29652 170 pp
Avail NTIS 1969

### The Moon as Viewed by Lunar Orbiter

*F. El-Baz, L. J. Kosofsky*

Selected compilation of Lunar Orbiter photographs showing salient features of lunar surface.

NASA SP-200
N70-30817 156 pp
Avail GPO 1970

### Analysis of Apollo 8 Photography and Visual Observations

Apollo 8 observations of lunar topography.

NASA SP-201
N70-14366 403 pp
Avail GPO 1969

### Aerospace Food Technology

Operational and technological problems of improvement in space flight feeding for future manned space missions. Conference, April 1969.

NASA SP-202
N70-33835 215 pp
Avail NTIS 1970

### Introduction to Abstract Analysis

*M. E. Goldstein, B. M. Rosenbaum*

Introduction to abstract analysis by definitions and proofs.

NASA SP-203
N70-21801 257 pp
Avail GPO 1969

### The Experiments of Biosatellite II

*J. F. Saunders*

Experiments with invertebrates, plants, and cellular systems on Biosatellite II flight.

NASA SP-204
N72-20048 358 pp
Avail GPO 1971

### Biotechnology

Biotechnological problems on man-machine systems required for long duration space flights. Conference, August 1967.

NASA SP-205
N71-28526 283 pp
Avail GPO 1971



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### Lunar Orbiter Photographic Atlas of the Moon

*D. E. Bowker, J. K. Hughes*

Atlas of reconstructed lunar photographs taken by Lunar Orbiters during 1966 and 1967.

NASA SP-206
N73-13879 723 pp
Avail GPO 1971

### Basic Aerodynamic Noise Research

*I. R. Schwartz*

Aerodynamic noise related to aircraft propulsion systems. Conference, July 1969.

NASA SP-207
N70-22850 540 pp
Avail GPO 1969

### The Prevention of Electrical Breakdown in Spacecraft

*D. Burrowbridge, F. W. Paul*

NASA SP-208
N70-18656 103 pp
Avail NTIS 1969

### Applications of Research on Human Decision Making

*R. M. Patton, J. A. Swets, T. A. Tanner, Jr.*

Human decision making in manned space flight including topics of memory models, signal detection, and pilot performance. Symposium, February 1968.

NASA SP-209
N70-22743 198 pp
Avail GPO 1970

### Electric Propulsion Mission Analysis Nomenclature and Terminology

Terminology for establishing system parameters of electric propulsion mission analysis.

NASA SP-210
N70-11179 15 pp
Avail NTIS 1969

### Future Fields of Control Application

Application of control theory to production engineering, transportation systems, urban development, biological oceanography, mass communications, and socio-economic problems. Conference, February 1969.

NASA SP-211
N69-39957 144 pp
Avail NTIS 1969

### Progress of NASA Research on Warm Fog Properties and Modification Concepts

Research on warm fog properties and dispersal concepts. Symposium, February 1969.

NASA SP-212
N69-39526 127 pp
Avail NTIS 1969

### A Long-Range Program in Space Astronomy: Position Paper of the Astronomy Missions Board

*R. O. Doyle*

Potential for advancement of astronomy by space programs.

NASA SP-213
N69-41150 316 pp
Avail GPO 1969

### Apollo 11: Preliminary Science Report

Preliminary scientific observations of Apollo 11 mission.

NASA SP-214
N70-10030 209 pp
Avail NTIS 1969

### Fifth Annual NASA-University Conference on Manual Control

Studies on display systems, optimal control methods, human performance theory, and neuromuscular models. Conference, March 1969.

NASA SP-215
N70-30877 720 pp
Avail NTIS 1970

### Compressible Turbulent Boundary Layers

Compressibility of turbulent boundary layers: skin friction, heat transfer, flow velocity, temperature distribution, pressure gradients, and aerodynamic drag prediction methods. Conference, December 1968.

NASA SP-216
N70-10426 572 pp
Avail NTIS 1969

### Optical Space Communication

*S. Karp, R. S. Kennedy*

Results of workshop on optical communication systems for space applications.

NASA SP-217
N70-18087 154 pp
Avail NTIS 1969

DOCUMENT AVAILABLE

### Analysis of a Jet in a Subsonic Crosswind

Jet exhaust flow effects on aerodynamic characteristics of V/STOL aircraft during transition flight. Conference, September 1969.

NASA SP-218
N70-11826 242 pp
Avail NTIS 1969

### Status of Passive Inflatable Falling-Sphere Technology for Atmospheric Sensing to 100 km

Symposium, September 1969.

NASA SP-219
N70-18570 307 pp
Avail NTIS 1969

### NASA Acoustically Treated Nacelle Program

Program to reduce jet aircraft noise. Conference, October 1969.

NASA SP-220
N70-13901 160 pp
Avail NTIS 1969

### The NASTRAN Theoretical Manual

*R. H. MacNeal*

Finite element computer program for structural analysis.

NASA SP-221
N70-42934 480 pp
Avail COSMIC 1970

The NASTRAN Theoretical Manual (Level 15.0)

NASA SP-221 (01)
N72-29920 601 pp
Avail COSMIC 1972

The NASTRAN Theoretical Manual (Level 16)

NASA SP-221 (03)
N76-73931 751 pp
Avail COSMIC 1976

The NASTRAN Theoretical Manual (Level 17)

NASA SP-221 (04)
Avail COSMIC 1979

### The NASTRAN User's Manual

*C. W. McCormick*

User manual for NASA structural analysis program to describe structural modeling techniques and computer programming operations.

NASA SP-222
N70-41755 812 pp
Avail COSMIC 1970

The NASTRAN User's Manual (Level 15.0)

NASA SP-222 (01)
N72-29921 1540 pp
Avail COSMIC 1973

### The NASTRAN User's Manual (cont.)

The NASTRAN User's Manual (Level 16)

NASA SP-222 (03)
N76-73933 1240 pp
Avail COSMIC 1976

The NASTRAN User's Manual (Level 17)

NASA SP-222 (04)
N80-26694 867 pp
Avail COSMIC 1979

The NASTRAN User's Manual (Level 17.5)

NASA SP-222 (05)
Avail COSMIC 1980

### The NASTRAN Programmer's Manual

*F. J. Douglas*

Digital computer programs for analysis of large complex structures.

NASA SP-223
N70-43143 1514 pp
Avail COSMIC 1970

The NASTRAN Programmer's Manual (Level 15.0)

NASA SP-223 (01)
N73-17892 2309 pp
Avail COSMIC 1972

The NASTRAN Programmer's Manual (Level 16)

NASA SP-223 (03)
N78-29505 3444 pp
Avail COSMIC 1976

### The NASTRAN Demonstration Problem Manual

NASA SP-224
N70-41756 134 pp
Avail COSMIC 1970

The NASTRAN Demonstration Problem Manual (Level 15.0)

NASA SP-224 (01)
N72-29919 187 pp
Avail COSMIC 1972

The NASTRAN Demonstration Problem Manual (Level 16)

NASA SP-224 (03)
N76-74317 259 pp
Avail COSMIC 1976

The NASTRAN Demonstration Problem Manual (Level 17.5)

NASA SP-224 (05)
Avail COSMIC 1980

### Mariner-Mars 1969: A Preliminary Report

Scientific data from Mariners 6 and 7 Mars flyby missions during 1969.

NASA SP-225
N70-18343 148 pp
Avail NTIS 1969


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### Plasmas and Magnetic Fields in Propulsion and Power Research

Conference, October 1969.

NASA SP-226
N70-18726 253 pp
Avail NTIS 1970

### Aerospace Structural Materials

Development of aerospace structural materials: heat-resistant alloys, refractory materials, transition metals, and composite materials. Conference, November 1969.

NASA SP-227
N70-20860 334 pp
Avail NTIS 1970

### Analytic Methods in Aircraft Aerodynamics

Analysis of aircraft aerodynamic characteristics. Symposium, October 1969.

NASA SP-228
N70-21351 750 pp
Avail NTIS 1970

### Proceedings of the 7th Annual Meeting of the Working Group on Extraterrestrial Resources

Lunar water detection and removal, soil adhesion and friction, and other lunar and planetary resources recovery. Conference, July 1969.

NASA SP-229
N70-39276 148 pp
Avail GPO 1970

### Ecological Surveys from Space

Spaceborne photography using different combinations of film and filters for Earth resources surveys.

NASA SP-230
N70-26981 80 pp
Avail GPO 1970

### EXAMETNET Data Report Series Annual Report, 1968

Meteorological rocket launchings and data dissemination for 1968 from EXAMETNET.

NASA SP-231
N70-29741 184 pp
Avail NTIS 1970

### Analysis of Apollo 10 Photography and Visual Observations

Lunar geology, crater, and volcanic feature analysis from Apollo 10 visual observations and photo interpretations.

NASA SP-232
N71-27871 231 pp
Avail GPO 1971

### Optical Telescope Technology

Design optics and technology for large spaceborne astronomical telescopes. Workshop, May 1969.

NASA SP-233
N70-36676 795 pp
Avail NTIS 1970

### Portable Life Support Systems

Portable life support and environmental control systems. Conference, May 1969.

NASA SP-234
N70-28501 380 pp
Avail NTIS 1970

### Apollo 12: Preliminary Science Report

Preliminary scientific analyses of Apollo 12 ALSEP data, lunar photographs, and returned materials.

NASA SP-235
N70-35271 235 pp
Avail NTIS 1970

### Research on Uranium Plasmas and Their Technological Applications

*R. T. Schneider, K. Thom*

Uranium plasmas applied to nuclear rocket engines, MHD generators, nuclear lasers, and plasma stability and flow. Symposium, January 1970.

NASA SP-236
N71-33625 503 pp
Avail GPO 1971

### Interdisciplinary Approach to the Lubrication of Concentrated Contacts

*P. M. Ku*

Lubrication, wear, and design aspects of rolling contact bearings. Symposium, July 1969.

NASA SP-237
N71-26826 595 pp
Avail GPO 1970

### Apollo 11 Mission Report

Apollo 11 postflight analysis and mission report.

NASA SP-238
N71-25042 228 pp
Avail NTIS 1970

### Kinetics and Thermodynamics in High-Temperature Gases

Conference on kinetics and thermodynamics of combustion and high-temperature gases. Conference, March 1970.

NASA SP-239
N70-32106 150 pp
Avail NTIS 1970

BEST DOCUMENT AVAILABLE

### The Mixed State of Superconductors

*W. R. Hudson*

Mathematical models for mixed state of superconductors.

NASA SP-240
N71-10415 73 pp
Avail GPO 1970

### Atlas and Gazeteer of the Near Side of the Moon

*G. L. Gutschewski, D. C. Kinsler, E. Whitaker*

Atlas of annotated Lunar Orbiter 4 photographs of near side of Moon, with gazeteer.

NASA SP-241
N72-18820 539 pp
Avail GPO 1971

### Guide to Lunar Orbiter Photographs

*T. P. Hansen*

Lunar Orbiter photographs and maps, missions 1 through 5.

NASA SP-242
N71-36179 254 pp
Avail GPO 1970

### Introduction to Experimental Techniques of High-Energy Astrophysics

*H. Oegelman, J. R. Wayland*

Measurements of cosmic rays and high-energy extraterrestrial particles.

NASA SP-243
N71-11415 259 pp
Avail NTIS 1970

### Power Processing

*F. C. Schwarz*

Electrical engineering aspects of electric power processing and component technology.

NASA SP-244
N72-15229 53 pp
Avail GPO 1971

### Recent Advances in Refractory Alloys for Space Power Systems Conference Papers

Evaluation of refractory tantalum-, tungsten-, niobium-, and molybdenum-based alloys for space power systems applications. Conference, June 1969.

NASA SP-245
N71-13301 299 pp
Avail NTIS 1970

### Lunar Photographs From Apollos 8, 10, and 11

*R. G. Musgrove*

A catalog.

NASA SP-246
N71-29260 24 pp
Avail GPO 1971

### The Development of Cryogenic Storage Systems for Space Flight

*R. K. Allgeier, Jr., M. L. Davis, T. G. Rogers, et al.*

Development of cryogenic storage systems for manned space flight.

NASA SP-247
N71-30910 132 pp
Avail GPO 1970

### Holographic Instrumentation Applications

*R. M. Brown, B. Ragent*

Investigating possibilities and limitations of applying holographic techniques to aerospace technology. Conference, January 1970.

NASA SP-248
N71-12776 249 pp
Avail NTIS 1970

### Cosmic Gamma Rays

*F. W. Stecker*

Cosmic gamma ray production processes, galactic and extragalactic gamma rays, and cosmology.

NASA SP-249
N71-24764 231 pp
Avail GPO 1971

### This Island Earth

*O. W. Nicks*

Spaceborne photographs of Earth atmosphere, lands, and waters with photographs of Sun, Moon, and planets.

NASA SP-250
N71-12566 192 pp
Avail GPO 1970

### Significant Accomplishments in Science and Technology: Goddard Space Flight Center, 1969

Aerospace scientific and technological studies in 1969 for satellite systems and spacecraft missions.

NASA SP-251
N71-25256 376 pp
Avail NTIS 1970

### The Entry Plasma Sheath and Its Effects on Space Vehicle Electromagnetic Systems. Volume I

Plasma sheath diagnostics and reduction for improved reentry communication. Symposium, October 1970.

NASA SP-252
N71-21101 614 pp
Avail NTIS 1970

DOCUMENT AVAILABLE

### The Entry Plasma Sheath and Its Effects on Space Vehicle Electromagnetic Systems. Volume 2

Conference on entry plasma sheath and effects on space vehicle electromagnetic systems.

NASA SP-253 132 pp
X71-10400 1970

### The Entry Plasma Sheath and Its Effects on Space Vehicle Electromagnetic Systems.

Classified document.

NASA SP-254 122 pp
X71-76576 1971

### Third Conference on Sonic Boom Research

*I. R. Schwartz*

Prediction methods for sonic boom generation and propagation with overpressure minimization in supersonic transport design and operation. Conference, October 1970.

NASA SP-255
N71-28363 431 pp
Avail GPO 1971

### Astronomical Use of Television-Type Image Sensors

*V. R. Boscarino*

Use of TV-type image sensors in astronomical photometry. Symposium, May 1970.

NASA SP-256
N71-28509 217 pp
Avail NTIS 1971

### A Search for Carbon and Its Compounds in Lunar Samples From Mare Tranquillitatis

*K. A. Kvenvolden, C. Ponnamperuma*

Determination of carbon content of lunar samples from Apollo 11 flight.

NASA SP-257
N71-17964 127 pp
Avail NTIS 1970

### Performance and Dynamics of Aerospace Vehicles

Performance, dynamics, and design of aeronautical and space vehicles.

NASA SP-258
N71-24701 670 pp
Avail NTIS 1971

### Aircraft Propulsion

Conference, November 1970.

NASA SP-259
N71-19451 463 pp
Avail NTIS 1971

### NASTRAN: A Summary of the Functions and Capabilities of the NASA Structural Analysis Computer System

*T. G. Butler, D. Michel*

Description of general purpose digital computer program for analysis of elastic structures under various loading conditions using finite element method approach.

NASA SP-260
N71-21559 27 pp
Avail NTIS 1971

### Preliminary Results From an Operational 90-Day Manned Test of a Regenerative Life Support System

*D. C. Grana, A. O. Pearson*

Data from 90-day manned test of regenerative life support system in space station simulator. Symposium, November 1970.

NASA SP-261
N71-20951 579 pp
Avail NTIS 1971

### Animal Orientation and Navigation

*S. R. Galler, K. Schmidt-Koenig, G. J. Jacobs, et al.*

Animal orientation and navigation capabilities. Symposium, September 1970.

NASA SP-262
N72-25062 586 pp
Avail GPO 1972

### The Mariner 6 and 7 Pictures of Mars

*S. A. Collins, Jr.*

Mariner 6 and 7 imagery photographs of Mars.

NASA SP-263
N73-13878 168 pp
Avail GPO 1971

### Barium Releases at Altitudes Between 200 and 1000 Kilometers: A Joint MPI-NASA Experiment

*D. Adamson, H. T. Baber, Jr., K. H. Crumbly*

Barium releases from Javelin and Nike-Tomahawk sounding rockets for ion cloud study of Earth electric and magnetic fields.

NASA SP-264
N71-29671 145 pp
Avail NTIS 1971

### Report of the Joint DOT-NASA Civil Aviation R&D Policy Study, March 1971

Review of policies affecting civil aviation, problems confronting it, and potential for future contributions to national benefit.

NASA SP-265
N71-30506 104 pp
Avail NTIS 1971

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### Joint DOT-NASA Civil Aviation Policy Study (Supporting Papers)

Civil aviation research and development projects noting characteristics and growth to date, current problems, future requirements, potential solutions, and recommendations.

NASA SP-266
N71-30507 248 pp
Avail NTIS 1971

### Physical Studies of the Minor Planets

*T. Gehrels*

Astronomical observations of asteroids. Conference, March 1971.

NASA SP-267
N72-25753 713 pp
Avail GPO 1971

### The Pioneer Mission to Jupiter

Planning for Pioneer interplanetary missions with Jupiter flyby.

NASA SP-268
N71-32366 48 pp
Avail GPO 1971

### Hypogravic and Hypodynamic Environments

*M. McCally, R. H. Murray*

Aerospace environments, manned space flight, weightlessness simulation, musculoskeletal and cardiovascular systems, bone loss, mineral metabolism, and hematology. Conference, July 1969.

NASA SP-269
N71-33251 380 pp
Avail NTIS 1971

### NASA Aircraft Safety and Operating Problems. Volume 1

Conference, May 1971.

NASA SP-270
N71-30756 444 pp
Avail NTIS 1971

### NASA Aircraft Safety and Operating Problems. Volume 2

NASA aircraft safety and operational problems of high altitude supersonic cruise aircraft. Conference, May 1971.

NASA SP-271 50 pp
X71-10673 1971

### Apollo 14 Preliminary Science Report

Lunar topographic, geologic, magnetic field, gravitation, and atmospheric data from Apollo 14 experiments and photography.

NASA SP-272
N71-30953 313 pp
Avail GPO 1971

### Computer Program for Calculation of Complex Chemical Equilibrium Composition, Rocket Performance, Incident and Reflected Shocks, and Chapman-Jouguet Detonations

*S. Gordon, B. J. McBride*

Equations and computer program for calculating chemical equilibria in thermodynamic states of complex systems.

NASA SP-273
N71-37775 250 pp
Avail NTIS 1971

### A Compilation of Nondimensional Numbers

*N. S. Land*

Identification and compilation of named nondimensional numbers used in technical areas.

NASA SP-274
N72-23982 126 pp
Avail GPO 1972

### Monitoring Earth Resources from Aircraft and Spacecraft

*R. N. Colwell*

Procedures and techniques for determining Earth resources from high altitude aircraft and Apollo 9 photographs.

NASA SP-275
N72-18331 203 pp
Avail GPO 1971

### Spacecraft Charge Buildup Analysis

*H. W. Bilsky, J. V. Gore, M. A. Kasha, et al.*

Design and characteristics of spacecraft propulsion system using charge buildup and electric propulsion techniques.

NASA SP-276
N71-32812 40 pp
Avail NTIS 1971

### Friction, Wear, and Lubrication in Vacuum

*D. H. Buckley*

Friction, wear, and lubrication of metals, nonmetal compounds, and polymers in vacuum environment.

NASA SP-277
N72-20451 192 pp
Avail NTIS 1971

### The Interplanetary Pioneers. Volume I. Summary

*W. R. Corliss*

Pioneer space probe project to show history, design, development, flight operations, and results accomplished.

NASA SP-278
N73-14864 135 pp
Avail GPO 1972


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### The Interplanetary Pioneers. Volume II. System Design and Development

*W. R. Corliss*

Pioneer space probe system design and development, ground support system, tracking and communication, and data processing.

NASA SP-279
N73-17882 312 pp
Avail GPO 1972

### The Interplanetary Pioneers. Volume III. Operations

*W. R. Corliss*

Operational aspects of Pioneer program.

NASA SP-280
N73-20882 157 pp
Avail GPO 1972

### Seventh Annual Conference on Manual Control

Manual control systems for human operator modeling and display systems in man-machine environments. Conference, June 1971.

NASA SP-281
N73-10104 354 pp
Avail GPO 1972

### The Fifth Aerospace Mechanisms Symposium

Structural design principles and mechanical engineering methods for aerospace mechanisms used in orbital and space flights. Conference, June 1970.

NASA SP-282
N72-13391 196 pp
Avail NTIS 1971

### Earth Resources Survey Systems

Applications of remote sensing to agriculture, forestry, oceanography, urban development. Workshop, May 1971.

NASA SP-283
N73-16348 359 pp
Avail GPO 1972

### Analysis of Surveyor 3 Material and Photographs Returned by Apollo 12

Postflight analysis of parts from Surveyor 3 spacecraft, lunar material, and photographs brought back on Apollo 12 flight.

NASA SP-284
N72-26731 302 pp
Avail GPO 1972

### Remote Measurement of Pollution

Remote sensing techniques for measuring gaseous air pollution, water pollution, and particulate air pollution.

NASA SP-285
N72-18324 261 pp
Avail NTIS 1971

### Significant Accomplishments in Science: Goddard Space Flight Center, 1970

Research in Earth resources, meteorology, and interplanetary physics. Symposium, January 1971.

NASA SP-286
N72-23324 253 pp
Avail NTIS 1972

### What Made Apollo a Success?

Apollo spacecraft development, mission planning, and flight operations.

NASA SP-287
N72-12892 87 pp
Avail NTIS 1971

### Vibration of Shells

*A. W. Leissa*

Vibrational characteristics, mechanical properties, and stress analysis of thin shell structures of various cross sections.

NASA SP-288
N73-26924 435 pp
Avail GPO 1973

### Apollo 15: Preliminary Science Report

Apollo 15 flight accomplishments, lunar surface activities, lunar orbital activities, and photographic coverage.

NASA SP-289
N72-22814 502 pp
Avail GPO 1972

### Turbine Design and Application

*A. J. Glassman*

Review of turbine technology including thermodynamics, compressible fluid mechanics, fundamental turbine concepts, and velocity diagram design.

Volume I
NASA SP-290
N72-26685 101 pp
Avail GPO 1972

Volume II
NASA SP-290
N74-33476 152 pp
Avail GPO 1973

Volume III
NASA SP-290
N75-24741 141 pp
Avail GPO 1975

### The Transformation of Scientists and Engineers Into Managers

*J. A. Bayton, R. L. Chapman*

Principal problems and obstacles faced by specialists during the transition period when they are becoming managers.

NASA SP-291
N72-27986 135 pp
Avail GPO 1972

### Vehicle Technology for Civil Aviation: The Seventies and Beyond

Technological concepts for future transport aircraft developments in civil aviation. Conference, November 1971.

NASA SP-292
N72-12995 452 pp
Avail NTIS 1971

### Experimental InterAmerican Meteorological Rocket Network (EXAMETNET): The First Five Years, 1966–1970

Five-year assessment of EXAMETNET, meteorological rocket network of Argentina, Brazil, and United States for stratospheric soundings.

NASA SP-293
N72-17558 58 pp
Avail NTIS 1972

### Remote Sensing of the Chesapeake Bay

Remote sensing of resources contained in Chesapeake Bay to determine effects of environmental pollution. Conference, April 1971.

NASA SP-294
N72-26272 176 pp
Avail GPO 1972

### Significant Accomplishments in Technology: Goddard Space Flight Center, 1970

*J. M. Bridger*

Technological developments in satellite communications, tracking, antenna arrays, attitude control, orbit calculations, and instrumentation. Symposium, January 1971.

NASA SP-295
N72-25755 214 pp
Avail NTIS 1972

### Rocket/Nimbus Sounder Comparison (RNSC)

Radiance and temperature differences between rocket and Nimbus satellite systems.

NASA SP-296
N72-19892 46 pp
Avail NTIS 1972

### Numerical Marching Techniques for Fluid Flows With Heat Transfer

*R. W. Hornbeck*

Formulations and solutions for fluid flow problems with associated heat transfer.

NASA SP-297
N74-12992 349 pp
Avail GPO 1973

### Space Simulation

Symposium, May 1972.

NASA SP-298
N72-22250 1093 pp
Avail GPO 1972

### Holography and Optical Filtering

Holography and optical filtering techniques for structural analysis, material tests, and astronomical observation. Conference, May 1971.

NASA SP-299
N73-25540 195 pp
Avail GPO 1973

### Physics of the Solar System

*S. I. Rasool*

Solar system, solar physics, planetary atmospheres and structure, and origin of planets and Moon.

NASA SP-300
N72-25810 519 pp
Avail GPO 1972

### Supercritical Wing Technology: A Progress Report on Flight Evaluations

Supercritical wing development and results of F-8 and T-2C test programs. Symposium, February 1972.

NASA SP-301 141 pp
X72-10196 1972

### Second Conference on Portable Life Support Systems

Portable life support systems for human protection. Conference, May 1971.

NASA SP-302
N72-27106 350 pp
Avail NTIS 1972

### The Quiet Sun

*E. G. Gibson*

Textbook of solar physics.

NASA SP-303
N73-25846 344 pp
Avail GPO 1973

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## Fluid Mechanics, Acoustics, and Design of Turbomachinery

*B. Lakshminarayana, W. R. Britsch, W. S. Gearhart*

Part 1

NASA SP-304
N75-11174 419 pp
Avail GPO 1974

Part 2

NASA SP-304
N75-11191 447 pp
Avail GPO 1974

## Physics of the Space Environment

*R. E. Smith, S. T. Wu*

Upper atmospheric physics and chemistry, auroras, and solar flare forecasting. Colloquium, 1971.

NASA SP-305
N72-31384 176 pp
Avail NTIS 1972

## Compositions of Major and Minor Minerals in Five Apollo 12 Crystalline Rocks

*B. M. French, K. F. J. Heinrich, P. D. Loman, Jr., et al.*

Mineral analysis of lunar samples of crystalline rocks from Apollo 12 flight.

NASA SP-306
N73-16837 145 pp
Avail NTIS 1972

## Report of the Tape Recorder Action Plan Committee, March 13, 1972

Failure analysis of tape recorders for spacecraft applications.

NASA SP-307
N73-15225 52 pp
Avail NTIS 1972

## Solar Wind

*C. P. Sonett, P. J. Coleman, Jr., J. M. Wilcox*

Magnetic structure of interplanetary and solar magnetic fields and solar wind. Conference, March 1971.

NASA SP-308
N73-10760 728 pp
Avail GPO 1972

## Advanced Approaches to Fatigue Evaluation

Fatigue test evaluation for aircraft structures. Symposium, May 1971.

NASA SP-309
N72-29895 675 pp
Avail NTIS 1972

## The Scientific Results From the Orbiting Astronomical Observatory (OAO-2)

*A. D. Code*

Scientific observations by OAO of solar system, interstellar matter, stellar atmospheres, and galactic and extragalactic systems. Conference, August 1971.

NASA SP-310
N72-31810 597 pp
Avail NTIS 1972

## Aircraft Engine Noise Reduction

Conference, May 1972.

NASA SP-311
N73-12012 321 pp
Avail NTIS 1972

## Significant Accomplishments in Sciences: Goddard Space Flight Center, 1971

Research on remote sensing applications and satellite observation data. Symposium, November 1971.

NASA SP-312
N73-17934 220 pp
Avail NTIS 1972

## Space for Mankind's Benefit

*J. Vonputtkamer, T. J. McCullough*

Conference, November 1971.

NASA SP-313
N73-13829 415 pp
Avail GPO 1972

## Fifth Symposium on the Role of the Vestibular Organs in Space Exploration

Vestibular problems of manned space flight for weightlessness and reduced gravity conditions with emphasis on space station development, including morphological studies. Symposium, August 1970.

NASA SP-314
N74-18754 275 pp
Avail GPO 1973

## Apollo 16 Preliminary Science Report

Preliminary results of Apollo 16 investigations.

NASA SP-315
N73-21729 636 pp
Avail GPO 1972

## Advanced Methods for the Solution of Differential Equations

*M. E. Goldstein, W. H. Braun*

NASA SP-316
N74-10569 559 pp
Avail GPO 1973

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### Stellar Chromospheres

*S. D. Jordan, E. H. Avrett*

Stellar chromospheres and their compositions. Colloquium, February 1972.

NASA SP-317
N73-13792 318 pp
Avail GPO 1973

### Interdisciplinary Approach to Liquid Lubricant Technology

*P. M. Ku*

Requirements and functions of liquid lubricants, mineral oils, greases, theory of rheology, mechanics and thermodynamics in lubrication, environmental capability of liquid lubricants, wear corrosion and erosion. Symposium, January 1972.

NASA SP-318
N74-12219 569 pp
Avail GPO 1973

### Evolutionary and Physical Properties of Meteoroids

*C. L. Hemenway, P. M. Millman, A. F. Cook*

Astrophysical models for meteoroid formation and stellar and planetary evolutions developed from simulation composition studies. Colloquium, June 1971.

NASA SP-319
N74-19436 361 pp
Avail GPO 1973

### STOL Technology

Aerodynamic characteristics and short haul transportation applications. Conference, October 1972.

NASA SP-320
N73-32934 516 pp
Avail NTIS 1972

### Free Turbulent Shear Flows

*S. F. Birch*

Development of data, including two-dimensional shear layers and axisymmetric jets. Conference, July 1972.

Volume I. Conference Proceedings

NASA SP-321
N73-28154 763 pp
Avail NTIS 1973

Volume II. Summary of Data

NASA SP-321
N73-27213 94 pp
Avail NTIS 1973

### A Review of Methods for Predicting Air Pollution Dispersion

*J. J. Mathis, Jr., W. L. Grose*

Air pollution models, and problem areas in air pollution dispersion modeling.

NASA SP-322
N73-20658 46 pp
Avail NTIS 1973

### Accelerated Testing of Space Batteries

*J. McCallum, R. E. Thomas, J. H. Waite*

Accelerated life test program for space batteries.

NASA SP-323
N73-21958 220 pp
Avail NTIS 1973

### Project Management in NASA: The System and the Men

*R. H. Pontious, L. B. Barnes*

NASA SP-324
N74-15692 137 pp
Avail GPO 1973

### The Orbital Mechanics of Flight Mechanics

*R. S. Dunning*

Reference handbook on modern dynamic orbit theory.

NASA SP-325
N74-12482 164 pp
Avail NTIS 1973

### Significant Accomplishments in Technology: Goddard Space Flight Center, 1972

Technology utilization in spacecraft guidance, ground operations, communications and navigation systems, and sensor development. Symposium, November 1972.

NASA SP-326
N73-27816 186 pp
Avail NTIS 1973

### Significant Results Obtained From the Earth Resources Technology Satellite-1. Volume I: Technical Presentations

*S. C. Freden, E. P. Mercanti, M. A. Becker*

Symposium, March 1973.

NASA SP-327
N73-28207 1686 pp
Avail GPO 1973

BEST DOCUMENT AVAILABLE

### Life Beyond Earth and the Mind of Man

*R. Berendzen*

Social, philosophical, and humanistic impacts of possible existence of extraterrestrial life. Symposium, November 1972.

NASA SP-328
N73-30807 110 pp
Avail GPO 1973

### Mars as Viewed by Mariner 9

Photographs of the surface of Mars showing geologic features and effects of atmospheric phenomena.

NASA SP-329
N75-17270 279 pp
Avail GPO 1974

### Apollo 17 Preliminary Science Report

Apollo 17 site selection, mission description, geological investigation of landing site, lunar experiments, visual flight flash phenomenon, volcanic studies, mare ridges, remote sensing and photogrammetric studies, astronomical photography.

NASA SP-330
N74-18428 677 pp
Avail GPO 1973

### Significant Accomplishments in Sciences: Goddard Space Flight Center, 1972

Space applications research in astronomy and earth physics.

NASA SP-331
N73-31867 223 pp
Avail NTIS 1973

### The Gum Nebula and Related Problems

Symposium, May 1971.

NASA SP-332
N73-31731 246 pp
Avail NTIS 1973

### Design of Various Fixed-Geometry Water-Lubricated Hydrodynamic Journal Bearings for Maximum Stability

*F. T. Schuller*

NASA SP-333
N74-11305 101 pp
Avail NTIS 1973

### The Viking Mission to Mars

Preview of the mission.

NASA SP-334
N74-34287 82 pp
Avail NTIS 1974

### Advanced Scanners and Imaging Systems for Earth Observations

Electromechanical scanners, self-scanned solid state sensors, electron beam images, sensor related technology, user applications.

NASA SP-335
N74-11287 620 pp
Avail GPO 1973

### Seventh Conference on Space Simulation

Conference, November 1973.

NASA SP-336
N74-10232 935 pp
Avail GPO 1973

### The New Mars: The Discoveries of Mariner 9

*W. K. Hartmann, O. Raper*

A history of our knowledge of Mars—how we gained it and how it grew.

NASA SP-337
N75-13729 192 pp
Avail GPO 1974

### Advanced Electro-Optical Imaging Techniques

*S. Sobieski, E. J. Wampler*

Symposium, September 1972.

NASA SP-338
N74-17406 134 pp
Avail NTIS 1973

### Gamma-Ray Astrophysics

*F. W. Stecker, A. I. Trombka*

Symposium, May 1973.

NASA SP-339
N74-14465 425 pp
Avail GPO 1973

### The Atmosphere of Titan

*D. M. Hunten*

Spectroscopic and radiometric observations used to form models for the Titan atmospheric composition and circulation.

NASA SP-340
N74-20478 185 pp
Avail NTIS 1974

### Atlas of Surveyor 5 Television Data

*R. M. Batson, R. Jordan, K. B. Larson*

NASA SP-341
N75-14665 609 pp
Avail GPO 1974

### High Energy Phenomena on the Sun

*R. Ramaty, R. G. Stone*

Symposium, September 1972.

NASA SP-342
N74-21440 640 pp
Avail GPO 1973

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**The Rings of Saturn**

*F. D. Palluconi, G. H. Pettengill*

Preview of Mariner Jupiter-Saturn '77 space project. Workshop, August 1973.

NASA SP-343
N75-17236 221 pp
Avail GPO 1974

**Objectives and Models of the Planetary Quarantine Program**

*M. Werber*

Objectives of the planetary quarantine program and the history of early contamination prevention efforts.

NASA SP-344
N75-25604 140 pp
Avail GPO 1975

**Evolution of the Solar System**

*H. Alfvén, G. Arrhenius*

Physical process and experimental studies related to the origin and evolution of the solar system.

NASA SP-345
N77-12959 611 pp
Avail GPO 1976

**Aeroacoustics**

*M. E. Goldstein*

NASA SP-346
N74-35118 440 pp
Avail NTIS 1974

**Aerodynamic Analyses Requiring Advanced Computers**

Conference, March 1975.

Part 1

NASA SP-347
N76-10007 710 pp
Avail NTIS 1975

Part 2

NASA SP-347
N76-10031 779 pp
Avail NTIS 1975

**Radiative Property Data for Venusian Entry: A Compendium**

*J. J. Jones, R. E. Boughner, K. V. Haggard, et al.*

NASA SP-348
N75-12880 85 pp
Avail NTIS 1974

**Pioneer Odyssey: Encounter With a Giant**

*R. O. Fimmel, W. Swindell, E. Burgess*

Pioneer Jupiter mission objectives, hazards, spacecraft design, communication techniques, mission accomplishments, scientific payloads. (The Pioneer flyby of Saturn is included in NASA SP-446.)

NASA SP-349
N75-10130 183 pp
Avail GPO 1974

**Apollo Expeditions to the Moon**

*E. M. Cortright*

From planning stages through Apollo 17. The objectives and accomplishments of each mission are discussed.

NASA SP-350
N76-12956 324 pp
Avail GPO 1975

**Third Earth Resources Technology Satellite-1 Symposium. Volume 1: Technical Presentations, Section A**

*S. C. Freden, E. P. Mercanti, M. A. Becker*

Symposium, December 1973.

NASA SP-351
N74-30705 992 pp
Avail GPO 1974

**Third Earth Resources Technology Satellite-1 Symposium. Volume 1: Technical Presentations, Section B**

*S. C. Freden, E. P. Mercanti, M. A. Becker*

NASA SP-351
N74-30774 936 pp
Avail GPO 1974

**Rotorcraft Dynamics**

A dynamic structural analysis of rotary winged aircraft considering helicopter vibration and loads. Conference, February 1974.

NASA SP-352
N74-34489 370 pp
Avail NTIS 1974

**Corn Blight Watch Experiment. Summary Report**

NASA SP-353
N74-33861 17 pp
Avail GPO 1974



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### DOT/NASA Comparative Assessment of Brayton Engines for Guideway Vehicles and Buses

Volume I. Summary

NASA SP-354
N75-18577 47 pp
Avail NTIS 1975

Volume II. Analysis and Results

NASA SP-354
N75-22745 284 pp
Avail NTIS 1975

### Comet Kohoutek

*G. A. Gary*

Tail form, structure, and evolution; hydroxyl related observations; molecules and atoms in the coma and tail; photometry and radiometry; spacecraft and ground-based observation data. Color photographs. Workshop, June 1974.

NASA SP-355
N76-10938 281 pp
Avail NTIS 1975

### Third Earth Resources Technology Satellite-1 Symposium. Volume II: Summary of Results

*S. C. Freden, E. P. Mercanti, D. B. Friedman*

Results and applications of ERTS-1 data for solving resource management problems. Symposium, December 1973.

NASA SP-356
N75-10549 184 pp
Avail GPO 1974

### Third Earth Resources Technology Satellite-1 Symposium. Volume III: Discipline Summary Report

*S. C. Freden, E. P. Mercanti, D. B. Friedman*

Agriculture, forestry, and range resources; land use and mapping; mineral resource, geological structure, and landform surveys; water and marine resources; environmental surveys; interpretation techniques. Symposium, December 1973.

NASA SP-357
N74-33873 159 pp
Avail GPO 1974

### Wave Climate Model of the Mid-Atlantic Shelf and Shoreline (Virginian Sea): Model Development, Shelf Geomorphology, and Preliminary Results

*V. Goldsmith, W. D. Morris, R. J. Byrne, et al.*

Computerized wave climate model that applies linear wave theory and shelf depth information to predict wave behavior.

NASA SP-358
N75-23072 153 pp
Avail NTIS 1974

### Monterey Bay Study

*R. M. Bizzell, L. C. Wade*

Usefulness of Landsat system in the planning and development of resource systems on Earth.

NASA SP-359
N75-30629 33 pp
Avail GPO 1975

### Mission to Earth: Landsat Views the World

*N. M. Short, P. D. Lowman, Jr., S. C. Freden, et al.*

Four hundred color plates showing land cultural features.

NASA SP-360
N77-17532 926 pp
Avail GPO 1976

### Educator's Guide for Mission to Earth: Landsat Views the World

*M. A. Tindal*

Information for using Landsat imagery to aid in teaching earth science and geology, environmental studies, geography, social and urban studies.

Supplement to NASA SP-360
N80-10537 56 pp
Avail GPO 1978

### Significant Accomplishments in Science and Technology: Goddard Space Flight Center, 1973

Cometary physics, x-ray and gamma ray astronomy, solar and terrestrial physics, spacecraft technology, Earth Resources Technology Satellite (Landsat), Earth and ocean physics, communications and navigation, mission operations and data systems, network systems and operations. Symposium, December 1973.

NASA SP-361
N75-16422 360 pp
Avail NTIS 1975

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### Apollo Over the Moon: A View From Orbit

*H. Masursky, G. W. Colton, F. El-Baz, et al.*

Photographs taken by the Apollo metric camera system.

NASA SP-362
N78-21174 263 pp
Avail GPO 1978

### Technology and the Neurologically Handicapped

Bioengineering approaches to the treatment of neurologically handicapped persons; neurophysiological aspects of control systems and man-machine integration. Conference, September 1971.

NASA SP-363
N75-19975 278 pp
Avail NTIS 1974

### Data Collection System: Earth Resources Technology Satellite-1

*S. Cooper, P. T. Ryan*

Sensors, interface hardware, power supplies, environmental enclosures, data transmission, processing and distribution, maintenance and integration in resources management systems. Conference, May 1973.

NASA SP-364
N75-16050 127 pp
Avail NTIS 1975

### National Geodetic Satellite Program

*S. W. Henrikson*

Instruments used to obtain data, description of data, data processing theory, evaluation of results.

Part 1
NASA SP-365
N78-11545 523 pp
Avail NTIS 1977

Part 2
NASA SP-365
N78-11552 509 pp
Avail GPO 1977

### Possible Relationships Between Solar Activity and Meteorological Phenomena

*W. R. Bandeen, S. P. Maran*

Symposium, November 1973.

NASA SP-366
N76-14528 263 pp
Avail GPO 1975

### Introduction to the Aerodynamics of Flight

*T. A. Talay*

The atmosphere, fluid flow, subsonic flow effects, transonic flow, supersonic flow, aircraft performance, and stability and control.

NASA SP-367
N76-11043 203 pp
Avail NTIS 1975

### Biomedical Results From Apollo

*R. S. Johnston, L. F. Dietlein, C. A. Berry*

Crew health and inflight monitoring, preflight and postflight medical testing, inflight experiments, quarantine, and life support systems.

NASA SP-368
N76-12668 592 pp
Avail GPO 1975

### Forced-Flow Once-Through Boilers: NASA Research

*J. R. Stone, V. H. Gray, O. A. Gutierrez*

Research on boilers for use in spacecraft electrical power generation systems.

NASA SP-369
N75-32388 142 pp
Avail NTIS 1975

### The Soviet-American Conference on Cosmochemistry of the Moon and Planets

*J. H. Pomeroy, N. J. Hubbard*

Thermal history of the Moon; lunar gravitation and magnetism; chronology of the moon, planets, and meteorites; hypotheses about the origin and evolution of the Moon and planets; data on Mercury, Venus, Mars, Jupiter. Conference, June 1974.

Part 1
NASA SP-370
N78-12925 503 pp
Avail GPO 1977

Part 2
NASA SP-370
N78-12958 423 pp
Avail GPO 1977

### Large Scale Dynamic Systems

Large scale dynamic systems in terms of modern control theory in the fields of aeronautics, water resources, and electrical power. Workshop, August 1974.

NASA SP-371
N75-29845 206 pp
Avail NTIS 1975

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### NASA-University Conference on Aeronautics

Aeronautics and the education of the engineers, technical trends in aeronautics, and the role of the university in aeronautics. Conference, October 1974.

NASA SP-372
N75-29001 430 pp
Avail NTIS 1975

### Free Radical OH: A Molecule of Astrophysical and Aeronomic Interest

*H. Shardanand Mohan*

Rotational-vibrational transitions, dissociation and ionization processes, and spectral characteristics.

NASA SP-373
N75-29960 90 pp
Avail NTIS 1975

### Foundations of Space Biology and Medicine

*M. Calvin, O. G. Gazenko*

Volume I. Space as a Habitat

NASA SP-374
N76-26799 458 pp
Avail GPO 1975

Volume II. Ecological and Physiological Bases of Space Biology and Medicine

Book 1

NASA SP-374
N76-26809 415 pp
Avail GPO 1975

Book 2

NASA SP-374
N76-26819 756 pp
Avail GPO 1975

Volume III. Space Medicine and Biotechnology

NASA SP-374
N76-26829 542 pp
Avail GPO 1975

### The Use of Lasers for Hydrographic Studies

*H. H. Kim, P. T. Ryan*

Use of remote laser sensors in water pollution detection and identification, coastal environment monitoring, bathymetric depth sounding. Symposium, September 1973.

NASA SP-375
N75-30525 202 pp
Avail NTIS 1975

### Active Microwave Workshop Report

*R. E. Matthews*

Data on active microwave systems. Remote sensing of Earth/land features, ocean/atmosphere interactions, equipment and instrument technology. Workshop, July 1974.

NASA SP-376
N76-11811 513 pp
Avail GPO 1975

### Biomedical Results From Skylab

*R. S. Johnston, L. F. Dietlein*

Physiological responses of space crew to prolonged space flight stress.

NASA SP-377
N77-33780 502 pp
Avail GPO 1977

### Numerical Studies of Incompressible Viscous Flow in a Driven Cavity

Numerical methods that can be applied to the Navier-Stokes equations; cubic spline procedure.

NASA SP-378
N76-16023 132 pp
Avail NTIS 1975

### Eighth Conference on Space Simulation

State of the art in space simulation, spacecraft contamination, thermal control systems, biosciences, flammability. Conference, November 1975.

NASA SP-379
N76-11113 859 pp
Avail NTIS 1975

### Skylab Explores the Earth

Experiments to determine the types of data obtainable through visual observation by Skylab crews.

NASA SP-380
N77-28548 531 pp
Avail GPO 1977

### Aeronautical Propulsion

Engine design, exhaust gases, use of composites, bearings, supersonic and hypersonic propulsion. Conference, May 1975.

NASA SP-381
N75-31068 476 pp
Avail NTIS 1975

### The Atmosphere of Venus

*J. E. Hansen*

Dynamics, structure, chemistry and evolution of the atmosphere of Venus. Conference, October 1974.

NASA SP-382
N76-10933 202 pp
Avail NTIS 1975

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### Cepheid Modeling

*D. Fischel, W. M. Sparks*

Mathematical techniques used to model the instability behavior of cepheid variables. Conference, July 1974.

NASA SP-383
N76-10951 338 pp
Avail NTIS 1975

### Significant Accomplishments in Science and Technology: Goddard Space Flight Center, 1974

Earth resources and astronomy; photographs of satellite observations. Symposium, December 1974.

NASA SP-384
N76-10934 208 pp
Avail NTIS 1975

### Proceedings of the 1958 Flight Flutter Testing Symposium

Theory, methods, and techniques of flight flutter testing. Symposium, May 1958.

NASA SP-385
N76-10095 196 pp
Avail NTIS 1975

### Outlook for Space: Report to the NASA Administrator by the Outlook for Space Study Group

Future activities in the context of national needs, 1980–2000.

NASA SP-386
N76-18004 373 pp
Avail GPO 1976

### A Forecast of Space Technology: 1980–2000

Information management, scientific resources, management of energy and matter.

NASA SP-387
N76-18005 320 pp
Avail GPO 1976

### Analytical Applications of Bioluminescence and Chemiluminescence

*E. W. Chappelle, G. L. Picciolo*

NASA SP-388
N76-15538 119 pp
Avail NTIS 1975

### X-Ray Binaries

Satellite x-ray experiments and ground-based programs aimed at observation of x-ray binaries. Symposium, October 1975.

NASA SP-389
N76-26056 718 pp
Avail NTIS 1976

### Applications of Computer Graphics in Engineering

Conference, October 1975.

NASA SP-390
N76-16812 661 pp
Avail NTIS 1975

### Operational Applications of Satellite Snowcover Observations

*A. Rango*

Snow measurements made by Landsat and NOAA satellites were used to help forecast runoff and flooding. Conference, August 1975.

NASA SP-391
N76-16561 430 pp
Avail NTIS 1975

### The Space Telescope

Mission planning, telescope performance, optical detectors, mirror construction, pointing and control systems, data management, and maintenance of the telescope. Meeting, August 1975.

NASA SP-392
N76-23110 240 pp
Avail GPO 1976

### The Study of Comets

*B. Donn, M. J. Mumma, W. M. Jackson, et al.*

Photometry and spectrum analysis of Kohoutek comet and comet tails. Colloquium, November 1974.

Part 1

NASA SP-393
N76-21052 557 pp
Avail GPO 1976

Part 2

NASA SP-393
N76-21075 557 pp
Avail GPO 1976

### A Survey of Computational Aerodynamics in the United States

*A. Gessow, D. J. Morris*

Programs in theoretical and computational aerodynamics, including application for boundary layer flow, Navier-Stokes turbulence modeling, internal flows, two-dimensional configurations, subsonic and supersonic aircraft, transonic aircraft, and the Space Shuttle.

NASA SP-394
N78-11007 49 pp
Avail NTIS 1977

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### Second NASA Conference on Laser Energy Conversion

*K. W. Billman*

The possible transmission of high-power laser beams over long distances and their conversion to thrust, electricity, and other useful forms of energy. Conference, January 1975.

NASA SP-395
N76-21505 196 pp
Avail NTIS 1976

### Solar-Wind Interaction With the Planets Mercury, Venus, and Mars

*N. F. Ness*

Magnetic field and plasma measurements in the environments of Mars, Mercury, and Venus. Seminar, November 1975.

NASA SP-397
N76-25125 172 pp
Avail NTIS 1976

### The 1976 Standard Atmosphere Above 86-km Altitude

*R. A. Minzner*

Development of an atmospheric model, temperature and composition profiles.

NASA SP-398
N77-10755 77 pp
Avail NTIS 1976

### Skylab EREP Investigations Summary

*W. J. Pierson*

EREP data on agriculture, cartography, geology, hydrology, oceans atmosphere.

NASA SP-399
N79-17279 387 pp
Avail GPO 1978

### Skylab, Our First Space Station

*L. F. Beleu*

Skylab's role in the study of solar and stellar astronomy, data on solar physics and space processing experiments.

NASA SP-400
N77-27155 176 pp
Avail GPO 1977

### Skylab, Classroom in Space

*L. B. Summerlin*

Student-designed Skylab experiments and demonstrations on the effect of weightlessness.

NASA SP-401
N77-29189 190 pp
Avail GPO 1977

### A New Sun: The Solar Results From Skylab

*J. A. Eddy*

The Sun as seen by Skylab's cameras.

NASA SP-402
N79-22991 220 pp
Avail GPO 1979

### Volcanic Features of Hawaii. A Basis for Comparison With Mars

*M. H. Carr, R. Greeley*

Similarities and differences between the volcanoes of Hawaii and those on Mars. Photographs.

NASA SP-403
N80-23912 216 pp
Avail GPO 1980

### Skylab's Astronomy and Space Sciences

*C. A. Lundquist*

Skylab's multidisciplinary capabilities, including observations of stars and galaxies, energetic particles, interplanetary dust, Comet Kohoutek.

NASA SP-404
N79-34118 126 pp
Avail GPO 1979

### Vortex-Lattice Utilization

Implementation and application of the vortex-lattice method to aerodynamic design and analysis. Workshop, May 1976.

NASA SP-405
N76-28163 409 pp
Avail NTIS 1976

### Powered-Lift Aerodynamics and Acoustics

Conference on high-lift aerodynamics, high-speed and cruise aerodynamics, acoustics, propulsion aerodynamics and acoustics, aerodynamic and acoustic loads, and full-scale and flight research. May 1976.

NASA SP-406
N78-24046 502 pp
Avail NTIS 1976

### Space Shuttle

Flight system, mission profile, economic and social benefits, description of vehicle.

NASA SP-407
N76-31268 97 pp
Avail GPO 1976

### Viking 1: Early Results

Text and photos from the first weeks after the Viking 1 landing on Mars.

NASA SP-408
N76-28296 76 pp
Avail NTIS 1976

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### Wake Vortex Minimization

Research on the effect of wing span, wing flaps, spoilers, splines, and engine thrust on vortex attenuation. Symposium, February 1976.

NASA SP-409
N78-12017 403 pp
Avail NTIS 1977

### Satellite-Derived Global Oceanic Rainfall Atlas

*M. S. V. Rao, W. V. Abott III, J. S. Theon*

NASA SP-410
N77-19709 336 pp
Avail GPO 1976

### The Apollo-Soyuz Test Project Medical Report

*A. E. Nicogossian*

Clinical aspects and preflight and postflight research studies performed on the astronauts.

NASA SP-411
N77-30735 129 pp
Avail NTIS 1977

### Apollo-Soyuz Test Project Summary Science Report

Volume I. Astronomy, Earth Atmosphere and Gravity Field, Life Sciences, and Materials Processing

NASA SP-412
N78-17088 570 pp
Avail NTIS 1977

Volume II. Earth Observations and Photography

*F. El-Baz, D. M. Warner*

NASA SP-412
N80-10538 700 pp
Avail NTIS 1979

### Settlements in Space: A Design Study

*R. D. Johnson, C. Holbrow*

Concept of how people might permanently sustain life in space on a large scale; design of a system to colonize space.

NASA SP-413
N77-21106 191 pp
Avail GPO 1977

### On the Habitability of Mars: An Approach to Planetary Ecosynthesis

*M. M. Averner, R. D. Macelroy*

Examination of the possibility of utilizing Mars as a habitat for terrestrial life.

NASA SP-414
N77-12718 114 pp
Avail NTIS 1976

### Flutter Testing Techniques

Developments in methodology and data analysis techniques for flutter testing in flight and on the ground.

NASA SP-415
N77-21022 483 pp
Avail NTIS 1976

### Aircraft Safety and Operating Problems

Terminal area operations, flight dynamics and control, ground operations, atmospheric environment, structures and materials, power plants, noise, human factors engineering. Conference, October 1976.

NASA SP-416
N77-18081 644 pp
Avail NTIS 1976

### A Geological Basis for the Exploration of the Planets

*R. Greeley, M. H. Carr*

Relevance of planetary geology in relation to the origin and evaluation of the solar system and life. Stratigraphy, structural geology, and geochemistry of planets.

NASA SP-417
N77-15961 117 pp
Avail NTIS 1976

### Lunar Sample Studies

Technical examination of breccias, basalts, and anorthosites.

NASA SP-418
N77-27053 72 pp
Avail NTIS 1977

### The Search for Extraterrestrial Intelligence: SETI

*P. Morrison, J. Billingham, J. Wolfe*

Cosmic evolution, space communication, technological advances, search strategies and systems. Includes bibliography of reports concerning the search for extraterrestrial intelligence.

NASA SP-419
N78-18771 289 pp
Avail GPO 1977

### Voyager to Jupiter and Saturn

Voyager mission schedule and profiles for encounters, description of spacecraft and trajectories, scientific investigations and instruments.

NASA SP-420
N77-29046 62 pp
Avail NTIS 1977

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### Recognition of Compact Astrophysical Objects

*H. Ogelman, R. Rothschild*

Stellar evolution, pulsars, binary stars, x-ray signatures, gamma ray sources, temporal analysis of x-ray data.

NASA SP-421
N77-34063 200 pp
Avail NTIS 1977

### Calculation Methods for Compressible Turbulent Boundary Layers: State-of-the-Art, 1976

*D. M. Bushnell, A. M. Cary, Jr., J. E. Harris*

Equations and closure methods for compressible turbulent boundary layers, flow phenomena, three-dimensional layers.

NASA SP-422
N78-13371 146 pp
Avail NTIS 1977

### Atlas of Mercury

*M. E. Davies, S. E. Dornik, D. E. Gault, R. G. Strom*

Mariner 10 spacecraft, scientific mission, surface mapping techniques, topographic features of Mercury. Photographs, shaded relief maps, photomosaics.

NASA SP-423
N78-30025 135 pp
Avail GPO 1978

### The Voyage of Mariner 10: Mission to Venus and Mercury

*J. A. Dunne, E. Burgess*

Historical details of Mariner 10 mission, images of Venus and Mercury.

NASA SP-424
N78-27146 233 pp
Avail GPO 1978

### The Martian Landscape

Design of the facsimile camera, image sequencing, picture calibration, reconstruction of color, search for motion on Mars. Over 200 color and black and white photographs. Stereo pairs and stereopticon included.

NASA SP-425
N79-12984 160 pp
Avail GPO 1978

### Sun, Weather, and Climate

*J. R. Herman, R. A. Goldberg*

Solar-related correlation factors, long-term climatic trends, short-term meteorological correlations, obscuring influences, physical processes and mechanisms, recapitulation of Sun-weather relationships, guidelines for experiments.

NASA SP-426
N79-20961 365 pp
Avail GPO 1978

### High-Altitude Perspective

Capabilities of the NASA Ames Research Center U-2 aircraft for research or experimental programs.

NASA SP-427
N78-31508 33 pp
Avail GPO 1978

### Space Resources and Space Settlements

*J. Billingham, W. P. Gilbreath, B. Oleary, et al.*

Research needs for regenerative life-support systems, habitat design, dynamics and design of electromagnetic mass drivers, asteroids as resources for space manufacturing, processing of nonterrestrial materials.

NASA SP-428
N79-32225 292 pp
Avail GPO 1979

### Physiological Responses of Women to Simulated Weightlessness

*H. Sandler, D. L. Winter*

Subjects were exposed to centrifugation, lower body negative pressure, and exercise stress.

NASA SP-430
N79-13686 92 pp
Avail NTIS 1978

### The Space Shuttle at Work

*H. Allaway*

Operation, tasks and duties, design, future development of the Space Shuttle.

NASA SP-432
N80-30367 84 pp
Avail GPO 1979

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### Shuttle Atmospheric Lidar Research Program: Final Report of Science Working Group

Determination of global flow of water vapor and pollutants in the troposphere, improvement of chemical and transport models of the stratosphere and mesosphere, evaluation of radiative models of the atmosphere, investigation of chemistry and transport of thermospheric atomic species and magnetospheric aspects of Sun/weather relationships.

NASA SP-433
N80-11414 231 pp
Avail NTIS 1979

### An Emission-Line Survey of the Milky Way

*R. A. R. Parker, T. R. Gull, R. P. Kirschner*

The instrumentation used in an examination of the ionization structure of emission nebulae and of the galactic plane in general, and characteristics of the prints obtained.

NASA SP-434
N80-11966 224 pp
Avail GPO 1979

### Terminal Configured Vehicle Program Facilities Guide

Program established to conduct research and to develop and evaluate aircraft and flight management system technology concepts to benefit conventional takeoff and landing operations in the terminal area. Analyses, simulation and flight experiments.

NASA SP-435
N80-18028 67 pp
Avail NTIS 1980

### Project Orion: A Design Study of a System for Detecting Extrasolar Planets

*D. C. Black*

Design concept for a ground-based astrometric telescope that could significantly increase the potential accuracy of astrometric observations.

NASA SP-436
N80-27260 214 pp
Avail GPO 1980

### Mathematical Modeling of Diverse Phenomena

*J. C. Howard*

Tensor calculus applied to the formulation of mathematical models of diverse phenomena.

NASA SP-437
N80-13839 402 pp
Avail NTIS 1979

### Atlas of Mars

*R. M. Batson, P. M. Bridges, J. L. Inge*

Small-scale maps and photomosaics covering the entire surface of the planet Mars.

NASA SP-438
N80-16998 154 pp
Avail GPO 1979

### Voyage to Jupiter

*D. Morrison, J. Samz*

The story of the Voyager project, including many color photographs from the Voyager 1 and 2 flybys of Jupiter.

NASA SP-439
N81-10910 211 pp
Avail GPO 1980

### Viking Orbiter Views of Mars

*C. R. Spitzer*

A collection of Viking Orbiter images, including polar regions, moons, atmosphere, craters, and channels. Stereopticon included.

NASA SP-441
N81-11966 189 pp
Avail GPO 1980

### Lessons of the NASA Tech House

*H. Allaway*

Report of a family's one-year residence in Langley Research Center's experimental house of the future that combines advanced electronics, solar energy, water recycling, and fire-retardant materials.

NASA SP-442
N80-27219 41 pp
Avail GPO 1980

### Images of Mars: The Viking Extended Mission

*M. H. Carr, N. Evans*

Thirty black and white photographs of Mars, some taken as recently as 1979, showing volcanoes, lava plains, channels, canyons, plateaus, impact craters, surface features of Phobos and Deimos.

NASA SP-444
N80-26239 35 pp
Avail GPO 1980

### Pioneer: First to Jupiter, Saturn, and Beyond

*R. C. Fimmel, J. A. Van Allen, E. Burgess*

The missions of Pioneers 10 and 11 to Jupiter and Saturn and toward the outermost limits of the solar system. Descriptions of the spacecraft, the scientific payload, the mission and details of all scientific results. (Supersedes NASA SP-349)

NASA SP-446
N81-15925 293 pp
Avail GPO 1980


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*I. D. Ertel, M. L. Morse*

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*M. L. Morse, J. K. Bays*

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*C. G. Brooks, I. D. Ertel*

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Chronology on aerospace events and personalities.

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### Skylab: A Chronology

*R. W. Newkirk, I. D. Ertel, C. G. Brooks*

Early space station activities, Apollo applications, and Skylab development and operations. Includes appendix on experiments conducted on Skylab.

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### NASA Historical Data Book, 1958-1968. Volume I: NASA Resources

*J. Vannimmen, L. C. Bruno, R. L. Rosholt*

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### Astronautics and Aeronautics, 1975: A Chronology

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*R. L. Rosholt*

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*C. C. Alexander, J. M. Grimwood, L. S. Swenson, Jr.*

Technological and managerial history of Mercury project, including bibliography.

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*M. C. Green, M. Lomask*

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*W. R. Corliss*

Historical summary of the development and use of sounding rockets.

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*H. M. Nance*

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Three sealed battery systems—nickel-cadmium, silver-cadmium, and silver-zinc—for spacecraft power use.

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Technology handbook for machinists, mechanics, and technicians—shock absorbers and protective devices, machining, metal forming, welding and brazing, and precision tools.

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Resistance spot-welding of interconnecting electronic components.

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*A. G. Imgram, W. S. Lyman, H. L. Martin*

Cryogenic temperature investigations of aluminum, nickel, steel, titanium, and magnesium alloys.

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### Effects of Low Temperatures on the Mechanical Properties of Structural Metals

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*J. D. Plunkett*

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Conference on aerospace technology: materials, fabrication processes, electric power generation, instrumentation, lubrication, superconductivity, and plasma physics.

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*I. I. Islamoff*

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## NASA Contributions to Advanced Valve Technology

*L. C. Burmeister, J. B. Loser, E. C. Sneegas*

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## Vibrating Diaphragm Pressure Transducer

*J. D. King*

Vibrating diaphragm transducer for pressure measurements in wind tunnels—construction, sensitivity, stability, energy losses, and cost estimates.

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Cumulative index to NASA survey on technology utilization of aerospace research output.

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Welding methods bibliography with abstracts, and subject and author indices.

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Method for plating copper on aluminum using phosphate anodizing process.

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*I. A. Black, P. E. Glaser, R. S. Lindstrom, et al.*

Thermal insulation systems for cryogenic storage and high temperature protection.

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### Technical and Economic Status of Magnesium-Lithium Alloys

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Aerospace technological developments, trends, and potential commercial applications. Symposium, April 1965.

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### Microelectronics in Space Research

*R. M. Burger*

Technology survey of microelectronics in space research.

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*J. B. Bond, P. R. Dennis, D. W. Gates, et al.*

Survey on industrial applications of plasma arc devices.

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*V. D. Barth*

Tungsten powder metallurgy technology related to space vehicles and less traditional applications.

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### Bibliography on Electromechanical Transducers

Annotated bibliography on applications of electromechanical transducers.

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### Magnetic Tape Recording

*S. W. Athey*

Types of magnetic recording, elements of the tape recorder, recording methods, recorder electronics.

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*L. A. Scipio, A. L. Scipio*

Structural design, reinforced and composite materials and their applications.

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*D. C. Martin*

Brazing aluminum to titanium coated stainless steel to minimize formation of intermetallic compounds in joint.

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*W. J. Jones, W. C. Simpson*

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### Selected Electronic Circuitry

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Design and application potentials of general purpose, dexterous, cybernetic machines for human augmentation.

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Visual information display systems that are computer connected or updated with computer generated information.

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*C. E. Moeller*

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### The Metallurgy, Behavior, and Application of the 18-Percent Nickel Maraging Steels

*A. M. Hall, C. J. Slunder*

Metallurgy, behavior, and application of 18 percent nickel maraging steels.

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### Joining Ceramics and Graphite to Other Materials

*R. M. Evans, R. E. Monroe, H. E. Pattee*

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### Conference on Selected Technology for the Petroleum Industry

Selected aerospace technology for petroleum industry representatives—combustion, heat transfer, surface physics and chemistry, lubricants and bearings, hydrodynamics. Conference, December 1965.

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### NASA Contributions to Bioinstrumentation Systems

*B. Ettelson, M. Klagsbrun, D. Ukkestad, et al.*

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### "Nonglassy" Inorganic Fibers and Composites

*C. G. Harman*

Theory and developments in fiber-reinforced composites, whiskers, fibers, and metal wires.

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### Application of Biogeochemistry to Mineral Prospecting

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### Selected Technology for the Electric Power Industry

Selected conference papers on NASA technology utilization for electric power industry. Conference, September 1968.

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### NASA Contributions to Fluid-Film Lubrication

Survey of incompressible and compressible fluid film hydrostatic and hydrodynamic lubrication.

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*M. E. Campbell*

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### Some New Metal and Metal-Ceramic Composites

*S. Korman*

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### Commercial Potentials of Semipermeable Membranes

*E. J. Henley, H. K. Staffin, S. B. Tuwiner*

Semipermeable membrane technology for commercial and industrial applications.

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### High-Velocity Metalworking

*H. M. Gadberry, J. B. Loser, M. C. Noland, et al.*

High velocity electromagnetic, electrohydraulic, explosive, and pneumatic-mechanical methods of metal working.

NASA SP-5062
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### Vacuum Switchgear

*W. S. Emmerich*

Survey of vacuum switchgear technology.

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### NASA Contributions to Metal Joining

*J. Heuschkel, W. J. Reichenecker*

Survey of NASA supported metals joining research having industrial applications.

NASA SP-5064
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### Selected Machining and Metal Fabricating Technology

Machine tools and metal fabricating technology developments.

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### Adhesives, Sealants, and Gaskets

*S. N. Glarum, R. B. Perkins*

Adhesives, sealants, and gaskets developed to operate in space environment.

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### Assessing Technology Transfer

*G. J. Howick, R. L. Lesher*

Transfer and utilization of new technology in United States.

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### Properties and Current Applications of Magnesium-Lithium Alloys

*P. D. Frost, R. J. Jackson*

Physical properties, metallurgical processes, and applications of magnesium-lithium alloys.

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### Mathematical Computer Programs

*J. Arnold, T. Leth, J. Simpson*

Mathematical programs and programming techniques for digital computer operations.

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### Teleoperator Controls

*W. R. Corliss, E. G. Johnsen*

Engineering problems survey on teleoperator control systems.

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### Induction Heating Advances: Applications to 5800°F

*A. F. Leatherman, D. E. Stutz*

Technology utilization of induction heating systems up to 5800°F.

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### Air Pollution Monitoring Instrumentation

*A. Lieberman, P. Schipma*

Air pollution monitoring instrumentation developed for aerospace uses surveyed for industrial applications.

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### Pavement Grooving and Traction Studies

Runway and highway pavement grooving and traction studies. Conference, November 1968.

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### Clean Room Technology

*J. W. Useller*

Clean room technology for control of contaminants for component reliability.

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Avail GPO 1969

### Aerospace Related Technology

Technology utilization by industries of aerospace sciences and systems. Conference, May 1969.

NASA SP-5075
N69-31946 177 pp
Avail NTIS 1969

### Contamination Control Handbook

NASA SP-5076
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### Potting Electronic Modules

*R. E. Keith*

Developments in technology of encapsulating, potting, or embedding electronic modules.

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### Biomedical Research and Computer Application in Manned Space Flight

*J. F. Lindsey, J. C. Townsend*

Advanced application of computers for biomedical research in manned space flight.

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### Constructing Inexpensive Automatic Picture-Transmission Ground Stations

*C. H. Vermillion*

Equipment specifications and engineering drawings for automatic picture transmission ground stations.

NASA SP-5079
N68-19624 68 pp
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### Weather Satellite Picture Receiving Stations

*C. H. Vermillion*

Procurement and construction of automatic picture transmission ground station equipment for ESSA and Nimbus transmission.

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### Advancements in Teleoperator Systems

Proceedings from colloquium on transfer of teleoperator device technology. February 1969.

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### Nondestructive Testing—Trends and Techniques

Nondestructive testing and inspection methods using infrared microscopy, x-ray television, and ultrasonic measurements.

NASA SP-5082
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### Analytical Chemistry Instrumentation

*L. A. Cavanagh, R. F. Muraca, J. S. Whittick*

Instrumentation for chemical analysis of planetary environment and extraterrestrial life.

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### Machining and Grinding of Ultrahigh-Strength Steels and Stainless Steel Alloys

*F. W. Boulger, J. A. Gurklis, C. T. Olofson*

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### Adhesive Bonding of Stainless Steels Including Precipitation-Hardening Stainless Steels

*R. E. Keith, R. C. Martin, M. D. Randall*

Organic and inorganic adhesives for bonding of stainless steels and precipitation hardened stainless steels.

NASA SP-5085
N68-20056 125 pp
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### Shaping of Precipitation-Hardening Stainless Steels by Casting and Powder-Metallurgy

*V. D. Barth, J. G. Kura, H. O. McIntire*

NASA SP-5086
N68-19307 51 pp
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### Welding of Precipitation-Hardening Stainless Steels

*R. M. Evans, D. C. Martin, J. J. Vagi*

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N68-21429 194 pp
Avail NTIS 1968

### Deformation Processing of Precipitation-Hardening Stainless Steels

*F. W. Boulger, A. F. Gerds, D. E. Strohecker*

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### Thermal and Mechanical Treatment for Precipitation-Hardening Stainless Steels

*A. M. Hall, A. F. Hoenie, C. J. Slunder*

NASA SP-5089
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### Surface Treatments for Precipitation-Hardening Stainless Steels

Hard surfacing, electroplating, electrodeless plating, carburizing, nitriding, burnishing, explosive hardening, planishing, and peening of precipitation-hardenable stainless steels.

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N64-28053 19 pp
Avail GPO 1963

### Preparing Contractor Reports for NASA: Technical Illustrating

Technical illustrating: graphs, line drawings, perspective drawing, photographs, typography, and layout

NASA SP-7008
N64-26749 27 pp
Avail GPO 1964

### Lasers and Masers: A Continuing Bibliography

Published annually from 1965 to 1968.

NASA SP-7009
N65-25599 283 pp
Avail NTIS 1965

### Clarity in Technical Reporting

*S. Katzoff*

Mechanisms for writing abstracts and technical reports.

NASA SP-7010
N64-26421 30 pp
Avail GPO 1964

### Aerospace Medicine and Biology: A Continuing Bibliography

Published monthly.*

NASA SP-7011
Avail NTIS

### The International System of Units: Physical Constants and Conversion Factors

*E. A. Mechtly*

Tables of conversion factors and physical constants in International System of Units.

NASA SP-7012
N73-26969 23 pp
Avail GPO 1973

### NASA Publications Manual, 1974

NASA SP-7013
N75-13676 57 pp
Avail GPO 1974

### Bibliography Related to Human Factors System Program, July 1962–February 1964

*R. J. Potocko*

NASA SP-7014
N64-28817 242 pp
Avail NTIS 1964

### Extraterrestrial Life: A Bibliography

Part I: Report Literature

NASA SP-7015
N65-16598 80 pp
Avail NTIS 1964

Part II: Published Literature

NASA SP-7015
N66-16566 345 pp
Avail NTIS 1965

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### Guide to the Subject Indexes for Scientific and Technical Aerospace Reports

Guide to subject indexes for aerospace scientific and technological information processing and retrieval.

NASA SP-7016
N66-35686 471 pp
Avail NTIS 1966

### Planetary Atmospheres: A Continuing Bibliography

Published in 1965, 1966, and 1968.

NASA SP-7017
Avail NTIS

### A Selected Listing of NASA Scientific and Technical Reports for 1964

NASA SP-7018
N65-20163 1137 pp
Avail GPO 1965

### Contract Number Index to Reports Announced in CSTAR, Volume 2, 1964

Part 1

NASA SP-7019
N65-17535 156 pp
Avail NTIS 1965

Part 2

NASA SP-7019
N65-12088 80 pp
Avail NTIS 1964

### Lubrication, Corrosion, and Wear: A Continuing Bibliography

Published in 1965, 1966, and 1968.

NASA SP-7020
Avail NTIS

### Ballistocardiography: A Bibliography

NASA SP-7021
N65-35520 49 pp
Avail NTIS 1965

### Space Communications: Theory and Applications: A Bibliography

*L. C. Bickford, R. F. Filipowsky*

Volume 1. Modulation and Channels

NASA SP-7022(01)
N65-27821 486 pp
Avail GPO 1965

Volume 2. Coding and Detection Theory

NASA SP-7022(02)
N65-29846 426 pp
Avail NTIS 1965

Volume 3. Information Processing and Advanced Techniques

NASA SP-7022(03)
N65-31136 463 pp
Avail NTIS 1965

### Space Communications: Theory and Applications: A Bibliography (cont.)

Volume 4. Satellite and Deep Space Applications

NASA SP-7022(04)
N65-32187 303 pp
Avail NTIS 1965

### An Annotated Bibliography of Computer-Aided Circuit Analysis and Design

*C. W. Meissner, Jr.*

NASA SP-7023
N68-19882 44 pp
Avail NTIS 1968

### A Selected Listing of NASA Scientific and Technical Reports for 1965

Annotated bibliography on NASA scientific and technical reports for 1965 with corporate source, subject, and author indexes.

NASA SP-7024
N66-26846 1402 pp
Avail NTIS 1966

### Preparing Contractor Reports for NASA: Data Presentation

*P. P. Taylor, Jr.*

Guidelines for presentation of graphical and tabular data.

NASA SP-7025
N66-38488 32 pp
Avail NTIS 1966

### Particles and Fields Research: A Bibliography

*W. N. Hess, G. D. Mead*

Rocket and satellite research bibliography on magnetic and electric fields, and cosmic energetic particles.

NASA SP-7026
N66-30156 173 pp
Avail NTIS 1966

### Secondary Aerospace Batteries and Battery Materials: A Bibliography

*G. Halpert, W. H. Webster, Jr.*

Annotated bibliography on secondary aerospace battery materials and related processes from 1923 through 1968.

NASA SP-7027
N70-22825 154 pp
Avail NTIS 1969

### A Selected Listing of NASA Scientific and Technical Reports for 1966

NASA SP-7028
N67-29260 2078 pp
Avail GPO 1967

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### NASA Scientific and Technical Reports for 1967: A Selected Listing

NASA SP-7029
N68-29039 424 pp
Avail NTIS 1968

### NASA Thesaurus

Subject terms for indexing scientific and technical information.

Volume I. Alphabetical Listing, A-L
NASA SP-7030
N68-11307 441 pp
Avail NTIS 1967

Volume II. Alphabetical Listing, M-Z
NASA SP-7030
N68-11308 428 pp
Avail NTIS 1967

Volume III. Appendixes
NASA SP-7030
N68-11309 651 pp
Avail NTIS 1967

### Properties of Selected Radioisotopes. Volume I: Unclassified Literature

*J. Epstein, D. Harris*

Annotated bibliography of nuclear, chemical, and physical properties of nine radioactive isotopes.

NASA SP-7031
N68-29959 189 pp
Avail NTIS 1968

### Properties of Selected Radioisotopes. Volume II: Classified Literature

*J. Epstein, D. Harris*

NASA SP-7032 46 pp
X69-50006 1968

### NASA Scientific and Technical Reports for 1968: A Selected Listing

NASA SP-7033
N69-29492 453 pp
Avail NTIS 1969

### R and D Reporting: Guidance for Technical Monitors of NASA Contracts

Options and information resources open to NASA monitors.

NASA SP-7034
N70-14397 16 pp
Avail NTIS 1969

### NASA Scientific and Technical Reports and Publications for 1969: A Selected Listing

Bibliographic citations and abstracts of NASA scientific and technical reports with indexes.

NASA SP-7035
N70-34702 950 pp
Avail GPO 1970

### Remote Sensing of Earth Resources: A Literature Survey With Indexes

Annotated bibliography of literature on remote sensing of Earth resources announced between January/February 1962 and 1970.

NASA SP-7036
N70-41047 1220 pp
Avail NTIS 1970

### Remote Sensing of Earth Resources (Supplement)

Section 1. Abstracts
NASA SP-7036(01)
N75-25235 654 pp
Avail NTIS 1975

Section 2. Indexes
NASA SP-7036(01)
N75-25236 402 pp
Avail NTIS 1975

### Aeronautical Engineering: A Special Bibliography

Published monthly.*

NASA SP-7037
Avail NTIS

### Significant NASA Inventions Available for Licensing in Foreign Countries

Published in 1971, 1973, 1974, 1975, 1976, 1977.

NASA SP-7038
Avail GPO

### NASA Patent Abstracts Bibliography: A Continuing Bibliography

Published semiannually.*

NASA SP-7039
Avail NTIS

### NASA Thesarus Alphabetical Update

Thesaurus of postable and nonpostable subject terms currently approved for use in NASA scientific and technical information system.

NASA SP-7040
N72-15925 619 pp
Avail NTIS 1971

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### Earth Resources: A Continuing Bibliography

Published quarterly.*

NASA SP-7041
Avail NTIS

### Energy: A Special Bibliography With Indexes

NASA SP-7042
N74-29337 534 pp
Avail NTIS 1974

### Energy: A Continuing Bibliography With Indexes

Published quarterly.*

NASA SP-7043
Avail NTIS

### Secondary Aerospace Batteries and Battery Materials: A Bibliography (1969-1974)

*P. McDermott, G. Halpert, S. Ekpanyaskun, et al.*

NASA SP-7044
N77-16437 161 pp
Avail NTIS 1976

### Technology for Large Space Systems: A Continuing Bibliography

NASA SP-7046
N79-20146 164 pp
Avail NTIS 1979

### NASA Thesaurus

Volume I. Alphabetical Listing

NASA SP-7050
N76-17992 820 pp
Avail NTIS 1976

Volume II. Access Vocabulary

NASA SP-7050
N76-17993 442 pp
Avail NTIS 1976

### NASA Guidelines on Report Literature

NASA seeks for inclusion in its Scientific and Technical Information System research reports, conference proceedings, meeting papers, monographs, and doctoral and post-graduate theses which relate to the NASA mission and objectives. Topics of interest to NASA are presented.

NASA SP-7200
N79-13914 27 pp
Avail NTIS 1978

### Management: A Continuing Literature Survey With Indexes

Published annually.*

NASA SP-7500
Avail NTIS

### The Systems Approach to Management. An Annotated Bibliography With Indexes

NASA SP-7501
N69-34917 69 pp
Avail NTIS 1969

### OGO Program Summary: The Orbiting Geophysical Observatories

*J. E. Jackson, J. I. Vette*

NASA SP-7601
N76-19643 307 pp
Avail NTIS 1975

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### Buffeting During Atmospheric Ascent

Aeroelastic spacecraft design to minimize buffeting during atmospheric ascent.

NASA SP-8001
N71-20473 19 pp
Avail NTIS 1970

### Flight-Loads Measurements During Launch and Exit

NASA SP-8002
N66-85660 7 pp
Avail NTIS 1964

### Flutter, Buzz, and Divergence

NASA SP-8003
N70-71604 10 pp
Avail NTIS 1964

### Panel Flutter

Criteria for predicting, preventing, and evaluating panel flutter.

NASA SP-8004
N73-11932 52 pp
Avail NTIS 1972

### Solar Electromagnetic Radiation

Values for solar constant and solar spectral irradiance based on air and spaceborne observations for use in design of spacecraft, space vehicles, subsystems, and experiments.

NASA SP-8005
N71-30888 36 pp
Avail NTIS 1971

### Local Steady Aerodynamic Loads During Launch and Exit

NASA SP-8006
N70-71605 12 pp
Avail NTIS 1965

### Buckling of Thin-Walled Circular Cylinders

Predicting buckling of thin-walled, uniform stiffened and unstiffened circular cylindrical shells under static loading.

NASA SP-8007
N69-23520 58 pp
Avail NTIS 1968

### Prelaunch Ground Wind Loads

NASA SP-8008
N70-71628 16 pp
Avail NTIS 1965

### Propellant Slosh Loads

NASA SP-8009
N69-14553 188 pp
Avail NTIS 1968

### Models of Mars Atmosphere (1974)

NASA SP-8010
N75-19107 52 pp
Avail NTIS 1974

### Models of Venus Atmosphere (1972)

Engineering models of Venus atmosphere, based on theory and measured data.

NASA SP-8011
N73-16824 63 pp
Avail NTIS 1972

### Natural Vibration Model Analysis

*J. S. Archer*

Natural vibration model analysis as related to space vehicle design criteria.

NASA SP-8012
N69-22773 35 pp
Avail NTIS 1968

### Meteoroid Environment Model—1969 (Near Earth to Lunar Surface)

Meteoroid environment model for cometary origin near Earth to lunar surface.

NASA SP-8013
N69-40326 35 pp
Avail NTIS 1969

### Entry Thermal Protection

NASA SP-8014
N69-21545 37 pp
Avail NTIS 1968

### Guidance and Navigation for Entry Vehicles

Guidance and navigation for atmospheric entry phase of vehicles.

NASA SP-8015
N69-19518 47 pp
Avail NTIS 1968

### Effects of Structural Flexibility on Spacecraft Control Systems

Design and test criteria regarding structural flexibility effects on spacecraft stability and control systems.

NASA SP-8016
N69-37050 70 pp
Avail NTIS 1969

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### Magnetic Fields—Earth and Extraterrestrial

Strength and direction data on Earth and extraterrestrial magnetic fields for guidance in vehicle design.

NASA SP-8017
N69-40269 70 pp
Avail NTIS 1969

### Spacecraft Magnetic Torques

Magnetic torque resulting from interaction between magnetic properties of spacecraft and ambient magnetic field.

NASA SP-8018
N69-30339 55 pp
Avail NTIS 1969

### Buckling of Thin-Walled Truncated Cones

Buckling of thin-walled truncated conical shells under static loads.

NASA SP-8019
N69-24131 32 pp
Avail NTIS 1968

### Surface Models of Mars (1975)

NASA SP-8020
N75-32989 84 pp
Avail NTIS 1975

### Models of Earth's Atmosphere (90 to 2500 km)

Model for predicting atmospheric parameters at altitudes between 90 and 2500 km.

NASA SP-8021
N73-27325 63 pp
Avail NTIS 1973

### Staging Loads

Analysis of loads produced on spacecraft by staging operations and practices to ensure that staging loads are included in spacecraft design.

NASA SP-8022
N71-28654 30 pp
Avail NTIS 1969

### Lunar Surface Models

Engineering models of lunar topography including dielectric, optical, terrain, and crater models.

NASA SP-8023
N70-18901 60 pp
Avail NTIS 1969

### Spacecraft Gravitational Torques

Gravitational torque effects and analysis for satellite design.

NASA SP-8024
N70-23418 51 pp
Avail NTIS 1969

### Solid Rocket Motor Metal Cases

Guidelines and practices for design of solid rocket motor cases.

NASA SP-8025
N70-29740 103 pp
Avail NTIS 1970

### Spacecraft Star Trackers

Design criteria for spacecraft star trackers.

NASA SP-8026
N70-38721 69 pp
Avail NTIS 1970

### Spacecraft Radiation Torques

Radiation torque sources and effects on spacecraft and spacecraft attitude control system design.

NASA SP-8027
N71-24312 41 pp
Avail NTIS 1969

### Entry Vehicle Control

Stabilization and control systems for reentry vehicles.

NASA SP-8028
N70-28538 51 pp
Avail NTIS 1969

### Aerodynamic and Rocket-Exhaust Heating During Launch and Ascent

NASA SP-8029
N70-18828 33 pp
Avail NTIS 1969

### Transient Loads From Thrust Excitation

Analysis of transient loads produced by ignition of rocket engine during launch and flight operations for solid and liquid propellant rocket engines.

NASA SP-8030
N71-24281 28 pp
Avail NTIS 1969

### Slosh Suppression

Slosh suppression devices for aerospace vehicle control stability.

NASA SP-8031
N70-21848 36 pp
Avail NTIS 1969

### Buckling of Thin-Walled Doubly Curved Shells

Criteria and recommended practices for design of compressively loaded thin-walled doubly curved shells.

NASA SP-8032
N70-22556 55 pp
Avail NTIS 1969

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### Spacecraft Earth Horizon Sensors

Engineering design of spacecraft Earth horizon sensors.

NASA SP-8032
N70-35570 49 pp
Avail NTIS 1969

### Spacecraft Mass Expulsion Torques

Spacecraft design considerations associated with disturbance torques caused by mass expulsion.

NASA SP-8034
N70-36852 39 pp
Avail NTIS 1969

### Wind Loads During Ascent

Determining wind induced structural loads on space vehicles during ascent.

NASA SP-8035
N70-36955 36 pp
Avail NTIS 1970

### Effects of Structural Flexibility on Launch Vehicle Control Systems

Structural flexibility effects on launch vehicle control systems and design criteria.

NASA SP-8036
N70-39774 51 pp
Avail NTIS 1970

### Assessment and Control of Spacecraft Magnetic Fields

NASA SP-8037
N71-13078 30 pp
Avail NTIS 1970

### Meteoroid Environment Model—1970 (Interplanetary and Planetary)

Astronomical meteoroid environment model for space missions.

NASA SP-8038
N71-17525 69 pp
Avail NTIS 1970

### Solid Rocket Motor Performance Analysis and Prediction

Current design practices and technology for predicting propulsion performance of solid propellant rocket engine designs.

NASA SP-8039
N72-18785 115 pp
Avail NTIS 1971

### Fracture Control of Metallic Pressure Vessels

Design criteria for fracture optimization of metallic pressure vessels.

NASA SP-8040
N71-14150 65 pp
Avail NTIS 1970

### Captive-Fired Testing of Solid Rocket Motors

Captive-fired testing of solid rocket motors for design criteria.

NASA SP-8041
N71-30866 101 pp
Avail NTIS 1971

### Meteoroid Damage Assessment

Meteoroid damage determination and spacecraft structure protection and reliability.

NASA SP-8042
N71-25070 50 pp
Avail NTIS 1970

### Design-Development Testing

Criteria and procedures for testing spacecraft structural elements and components.

NASA SP-8043
N71-25069 35 pp
Avail NTIS 1970

### Qualification Testing

Qualification tests conducted on flight quality components, subsystems, and systems to prove that structural design requirements have been achieved.

NASA SP-8044
N71-29045 30 pp
Avail NTIS 1970

### Acceptance Testing

Standardization of structural acceptance tests conducted on flight hardware.

NASA SP-8045
N71-31033 34 pp
Avail NTIS 1970

### Landing Impact Attenuation for Non-Surface-Planing Landers

NASA SP-8046
N70-38294 47 pp
Avail NTIS 1970

### Spacecraft Sun Sensors

Design criteria and performance specifications for spacecraft Sun sensors.

NASA SP-8047
N71-17756 42 pp
Avail NTIS 1970

### Liquid Rocket Engine Turbopump Bearings

Bearing requirements for liquid rocket engine turbopumps.

NASA SP-8048
N71-28011 85 pp
Avail NTIS 1971

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### The Earth's Ionosphere

Space vehicle design with considerations for ionospheric electron and ionic density, plasma temperature of ionosphere, and neutral component.

NASA SP-8049
N71-30849 49 pp
Avail NTIS 1971

### Structural Vibration Prediction

Internal loads and stresses caused by space vehicle vibration resulting from induced or natural environments.

NASA SP-8050
N71-19281 41 pp
Avail NTIS 1970

### Solid Rocket Motor Igniters

Design approach for solid propellant rocket igniters.

NASA SP-8051
N71-30346 111 pp
Avail NTIS 1971

### Liquid Rocket Engine Turbopump Inducers

Design criteria for liquid rocket engine turbopump inducers.

NASA SP-8052
N71-34950 255 pp
Avail NTIS 1971

### Nuclear and Space Radiation Effects on Materials

Effects of nuclear and space radiation on mechanical, thermal, and optical properties of spacecraft structural materials.

NASA SP-8053
N71-25054 48 pp
Avail NTIS 1970

### Space Radiation Protection

Criteria and procedures for determining dosage of penetrating space radiation and design of appropriate protection for space vehicles.

NASA SP-8054
N71-25075 50 pp
Avail NTIS 1970

### Prevention of Coupled Structure-Propulsion Instability (Pogo)

NASA SP-8055
N71-26080 51 pp
Avail NTIS 1970

### Flight Separation Mechanisms

Criteria and recommended practices for designing and testing flight separation mechanisms.

NASA SP-8056
N71-28986 39 pp
Avail NTIS 1970

### Structural Design Criteria Applicable to A Space Shuttle

Updated structural design criteria for manned space shuttle missions.

NASA SP-8057
N73-17881 99 pp
Avail NTIS 1972

### Spacecraft Aerodynamic Torques

Assessment of disturbance torques due to interaction of spacecraft with atmosphere in long duration orbits for use in design of spacecraft attitude control systems.

NASA SP-8058
N71-25935 37 pp
Avail NTIS 1971

### Spacecraft Attitude Control During Thrusting Maneuvers

NASA SP-8059
N71-26198 51 pp
Avail NTIS 1971

### Compartment Venting

Analysis of internal and external gas venting system of spacecraft.

NASA SP-8060
N71-28166 31 pp
Avail NTIS 1970

### Interactions With Umbilicals and Launch Stand

Criteria and recommendations to ensure compatible interfaces between space vehicle structure and launch stand ground support equipment.

NASA SP-8061
N71-28829 25 pp
Avail NTIS 1970

### Entry Gasdynamic Heating

Determining heat transfer to space vehicles entering planetary atmospheres for proper design and thermal protection.

NASA SP-8062
N71-31179 60 pp
Avail NTIS 1971

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### Lubrication, Friction, and Wear

Lubrication, friction, and wear processes analyzed for space vehicle design criteria.

NASA SP-8063
N71-31471 180 pp
Avail NTIS 1971

### Solid Propellant Selection and Characterization

Analysis of properties of solid rocket propellants and parameters which affect choice of propellant for specific applications.

NASA SP-8064
N72-13737 116 pp
Avail NTIS 1971

### Tubular Spacecraft Booms (Extendible, Reel Stored)

Development of reliable and operational design programs for spacecraft guidance and control.

NASA SP-8065
N71-33330 52 pp
Avail NTIS 1971

### Deployable Aerodynamic Deceleration Systems

Criteria and recommended practices for design, selection, analysis, and testing of deployable aerodynamic deceleration systems.

NASA SP-8066
N71-31303 88 pp
Avail NTIS 1971

### Earth Albedo and Emitted Radiation

Global annual averages of Earth albedo and radiation used to estimate long term effects on space vehicle equipment and surfaces.

NASA SP-8067
N71-33104 48 pp
Avail NTIS 1971

### Buckling Strength of Structural Plates

Designs for determining buckling strength of structural plates for spacecraft.

NASA SP-8068
N71-33331 50 pp
Avail NTIS 1971

### The Planet Jupiter (1970)

Visible, infrared, and radio observations of Jupiter using Earth based and airborne equipment.

NASA SP-8069
N72-17009 95 pp
Avail NTIS 1971

### Spaceborne Digital Computer Systems

Design criteria for guidance and control spaceborne computer selection including physical and functional characteristics and reliability.

NASA SP-8070
N71-33679 82 pp
Avail NTIS 1971

### Passive Gravity-Gradient Libration Dampers

NASA SP-8071
N71-34590 60 pp
Avail NTIS 1971

### Acoustic Loads Generated by the Propulsion System

Design of flightworthy space vehicle.

NASA SP-8072
N71-33195 54 pp
Avail NTIS 1971

### Solid Propellant Grain Structural Integrity Analysis

NASA SP-8073
N74-19389 114 pp
Avail NTIS 1973

### Spacecraft Solar Cell Arrays

NASA SP-8074
N71-37630 54 pp
Avail NTIS 1971

### Solid Propellant Processing Factors in Rocket Motor Design

NASA SP-8075
N72-31767 82 pp
Avail NTIS 1971

### Solid Propellant Grain Design and Internal Ballistics

NASA SP-8076
N73-15804 110 pp
Avail NTIS 1972

### Transportation and Handling Loads

Criteria and recommended practices for predicting and verifying transportation and handling loads for space vehicle structure or major segments.

NASA SP-8077
N72-12891 48 pp
Avail NTIS 1971

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### Spaceborne Electronic Imaging Systems

Criteria and recommended practices for designing spaceborne elements of electronic imaging systems.

NASA SP-8078
N72-14169 71 pp
Avail NTIS 1971

### Structural Interaction With Control Systems

Predictions of structural interrelationships with spacecraft active and passive control systems to determine optimum design.

NASA SP-8079
N72-17920 56 pp
Avail NTIS 1971

### Liquid Rocket Pressure Regulators, Relief Valves, Check Valves, Burst Discs, and Explosive Valves

NASA SP-8080
N74-10724 123 pp
Avail NTIS 1973

### Liquid Propellant Gas Generators

Design of gas turbine for furnishing hot gases for turbine drives and analysis of limitations imposed by thermal stresses.

NASA SP-8081
N73-27705 110 pp
Avail NTIS 1972

### Stress-Corrosion Cracking in Metals

Criteria and recommended practices for preventing stress-corrosion cracking in spacecraft structures.

NASA SP-8082
N72-17928 42 pp
Avail NTIS 1971

### Discontinuity Stresses in Metallic Pressure Vessels

NASA SP-8083
N72-26933 69 pp
Avail NTIS 1971

### Surface Atmospheric Extremes (Launch and Transportation Areas)

Effects of atmospheric surface parameters on space vehicle design and operation.

NASA SP-8084
N74-30947 77 pp
Avail NTIS 1974

### The Planet Mercury (1971)

Physical properties of Mercury, including atmosphere and surface, for space vehicle design criteria.

NASA SP-8085
N72-20799 63 pp
Avail NTIS 1972

### Space Vehicle Displays Design Criteria

Design and evaluation of spacecraft display guidance and control systems.

NASA SP-8086
N72-26337 45 pp
Avail NTIS 1972

### Liquid Rocket Engine Fluid-Cooled Combustion Chambers

Monograph for design and development of combustion chambers for liquid propellant rocket engines.

NASA SP-8087
N73-31697 120 pp
Avail NTIS 1972

### Liquid Rocket Metal Tanks and Tank Components

NASA SP-8088
N75-13022 165 pp
Avail NTIS 1974

### Liquid Rocket Engine Injectors

NASA SP-8089
N76-30284 130 pp
Avail NTIS 1976

### Liquid Rocket Actuators and Operators

NASA SP-8090
N74-17785 158 pp
Avail NTIS 1973

### The Planet Saturn (1970)

Saturn planet and environment data for spacecraft designers.

NASA SP-8091
N72-29840 103 pp
Avail NTIS 1972

### Assessment and Control of Spacecraft Electromagnetic Interference

Design criteria relating to assessment and control of spacecraft electromagnetic interference.

NASA SP-8092
N72-26119 57 pp
Avail NTIS 1972

### Solid Rocket Motor Internal Insulation

NASA SP-8093
N77-30171 124 pp
Avail NTIS 1976

### Liquid Rocket Engine Valve Components

NASA SP-8094
N74-27276 150 pp
Avail NTIS 1973

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### Preliminary Criteria for the Fracture Control of Space Shuttle Structures

NASA SP-8095
N72-25851 16 pp
Avail NTIS 1971

### Space Vehicle Gyroscope Sensor Application

Analysis of factors involved in specification, design, and evaluation of gyroscopes for spaceborne sensor applications.

NASA SP-8096
N73-12680 87 pp
Avail NTIS 1972

### Liquid Rocket Valve Assemblies

NASA SP-8097
N74-26979 154 pp
Avail NTIS 1973

### Effects of Structural Flexibility on Entry Vehicle Control Systems

NASA SP-8098
N72-29870 68 pp
Avail NTIS 1972

### Combining Ascent Loads

Criteria and guidelines for combining loads during ascent phase of space flight.

NASA SP-8099
N73-11897 36 pp
Avail NTIS 1972

### Liquid Rocket Engine Turbopump Gears

NASA SP-8100
N75-10160 117 pp
Avail NTIS 1974

### Liquid Rocket Engine Turbopump Shafts and Couplings

NASA SP-8101
N74-14441 150 pp
Avail NTIS 1972

### Space Vehicle Accelerometer Applications

NASA SP-8102
N73-26893 87 pp
Avail NTIS 1972

### The Planets Uranus, Neptune, and Pluto (1971)

Influence of Uranus, Neptune, and Pluto environment on design of spacecraft probes.

NASA SP-8103
N73-11870 99 pp
Avail NTIS 1972

### Structural Interaction With Transportation and Handling Systems

Space vehicle design to withstand adverse conditions involved in handling and transportation from factory to launch site.

NASA SP-8104
N73-21839 41 pp
Avail NTIS 1973

### Spacecraft Thermal Environment

Guidance for assessment and control of spacecraft temperatures.

NASA SP-8105
N73-26890 48 pp
Avail NTIS 1973

### Turbopump Systems for Liquid Rocket Engines

NASA SP-8107
N75-20470 168 pp
Avail NTIS 1974

### Advanced Composite Structures

NASA SP-8108
N76-12115 107 pp
Avail NTIS 1974

### Liquid Rocket Engine Centrifugal Flow Turbopumps

NASA SP-8109
N74-28961 116 pp
Avail NTIS 1973

### Liquid Rocket Engine Turbines

NASA SP-8110
N74-34245 158 pp
Avail NTIS 1974

### Assessment and Control of Electrostatic Charges

NASA SP-8111
N74-27534 55 pp
Avail NTIS 1974

### Pressurization Systems for Liquid Rockets

NASA SP-8112
N76-22300 167 pp
Avail NTIS 1975

### Liquid Rocket Engine Combustion Stabilization Devices

NASA SP-8113
N75-28247 127 pp
Avail NTIS 1974

### Solid Rocket Thrust Vector Control

NASA SP-8114
N76-17194 200 pp
Avail NTIS 1974

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### Solid Rocket Motor Nozzles

NASA SP-8115
N76-20214 140 pp
Avail NTIS 1975

### The Earth's Trapped Radiation Belts

NASA SP-8116
N75-22980 100 pp
Avail NTIS 1975

### Gravity Fields of the Solar System

NASA SP-8117
N75-24608 79 pp
Avail NTIS 1975

### Interplanetary Charged Particle Models (1974)

NASA SP-8118
N75-24607 47 pp
Avail NTIS 1975

### Liquid Rocket Disconnects, Couplings, Fittings, Fixed Joints, and Seals

State of the art and design criteria for components used in liquid propellant rocket propulsion systems to contain and control the flow of fluids.

NASA SP-8119
N77-24191 164 pp
Avail NTIS 1976

### Liquid Rocket Engine Nozzles

NASA SP-8120
N77-16108 120 pp
Avail NTIS 1976

### Liquid Rocket Engine Turbopump Rotating-Shaft Seals

NASA SP-8121
N78-30584 160 pp
Avail NTIS 1978

### The Environment of Titan (1975)

NASA SP-8122
N7628138 45 pp
Avail NTIS 1976

### Liquid Rocket Lines, Bellows, Flexible Hoses, and Filters

NASA SP-8123
N78-16089 186 pp
Avail NTIS 1977

### Liquid Rocket Engine Self-Cooled Combustion Chambers

NASA SP-8124
N78-21211 130 pp
Avail NTIS 1977

### Liquid Rocket Engine Axial Flow Turbopumps

NASA SP-8125
N78-31164 127 pp
Avail NTIS 1978

### Glossary of Terms and Table of Conversion Factors Used in Design of Chemical Propulsion Systems

NASA SP-8126
N80-17136 89 pp
Avail NTIS 1979

DOCUMENT AVAILABLE

## NASA Specifications and Standards

NASA SP-9000
N67-34727 388 pp
Avail NTIS 1967

## A Guide to NASA Data Handbooks

Handbooks, manuals, procedures, instructions, and related technical data publications in NASA CENTRAL Information System.

NASA SP-9001
N67-18003 190 pp
Avail NTIS 1967

AVAILABLE

DIGITAL PAGE

### Overall Loudness of Steady Sounds According to Theory and Experiment

*W. L. Howes*

A mathematical theory for calculating the loudness of any steady sound from information on its spectrum constructed from physical principles and psychological and physiological information on mammalian auditory systems.

NASA RP-1001
N79-25753 150 pp
Avail GPO 1979

### Cryogenic Foam Insulation: Abstracted Publications

*F. R. Williamson*

The properties of foam materials and the use of foams as thermal insulation at cryogenic temperatures.

NASA RP-1002
N78-11200 171 pp
Avail NTIS 1977

### Bibliography of Supersonic Cruise Aircraft Research (SCAR)

*S. Hoffman*

Propulsion, stratospheric emissions impact, structures and materials, aerodynamic performance, stability and control.

NASA RP-1003
N78-12895 102 pp
Avail NTIS 1977

### Fronts and Frontogenesis as Revealed by High Time Resolution Data

*A. F. Frank, D. A. Barber*

Upper air sounding used to examine a cold front of average intensity.

NASA RP-1005
N77-30705 135 pp
Avail NTIS 1977

### Correcton Factors for On-Line Microprobe Analysis of Multielement Alloy Systems

*J. Unnam, D. R. Tenney, W. D. Brewer*

An on-line correction technique developed for the conversion of electron probe x-ray intensities into concentrations of emitting elements.

NASA RP-1006
N78-15250 210 pp
Avail NTIS 1977

### Viking Lander Imaging Investigation: Picture Catalog of Primary Mission Experiment Data Record

*R. B. Tucker*

Images returned by the two Viking Landers during the primary phase of the Viking Mission.

NASA RP-1007
N78-20042 514 pp
Avail NTIS 1978

### Lightning Protection of Aircraft

*F. A. Fisher, J. A. Plumer*

Potential lightning effects on aircraft and the means available to designers and operators to protect against the effects.

NASA RP-1008
N78-14024 530 pp
Avail NTIS 1977

### An Introduction to Orbit Dynamics and Its Application to Satellite-Based Earth Monitoring Systems

*D. R. Brooks*

The long-term behavior of satellites studied at a level of complexity suitable for the initial planning phases of Earth monitoring missions.

NASA RP-1009
N78-12113 85 pp
Avail NTIS 1977

### Chlorofluoromethanes and the Stratosphere

*R. D. Hudson*

Laboratory measurements, ozone measurements and trends, minor species and aerosol measurements, one-dimensional modeling, multidimensional modeling.

NASA RP-1010
N77-31694 268 pp
Avail NTIS 1977

### Thermodynamic and Related Properties of Oxygen From the Triple Point to 300 K at Pressures to 1000 Bar

*L. A. Weber*

The results of an experimental program presented in the form of PVT data in the temperature range 58 to 300 K at pressures up to 800 bar. Tables of the derived thermodynamic properties on isobars to 1000 bar are given.

NASA RP-1011
N78-16119 104 pp
Avail NTIS 1977



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### Remote Sensing of Oceanic Parameters During the Skylab/Gamefish Experiment

*K. H. Faller*

Effort to demonstrate the feasibility of using remotely acquired information to assess and monitor the distribution of oceanic gamefish.

NASA RP-1012
N78-12644 43 pp
Avail NTIS 1977

### Triple Point Determinations of Monomethylhydrazine and Nitrogen Tetroxide, 2.2 Percent by Weight Nitric Oxide

*I. D. Smith, P. M. Dodge*

Tests performed to ascertain the triple points of monomethylhydrazine and nitrogen tetroxide. New experimental values for liquid monomethylhydrazine vapor pressure for temperatures from 275.2 to 207.6 K. Tentative values for the effective freezing point of nitrogen tetroxide in spacelike conditions.

NASA RP-1013
N78-13234 16 pp
Avail NTIS 1977

### An Outgassing Data Compilation of Spacecraft Materials

*W. A. Campbell, Jr., R. S. Marriott, J. J. Park*

Outgassing data derived from tests at 398 K (125°C) or 24 hours in vacuum for numerous materials for spacecraft use.

NASA RP-1014
N78-17151 181 pp
Avail NTIS 1978

### Procedures for Gathering Ground Truth Information for a Supervised Approach to a Computer-Implemented Land Cover Classification of Landsat-Acquired Multispectral Scanner Data

*A. T. Joyce*

NASA RP-1015
N78-15549 48 pp
Avail NTIS 1978

### The Use of Landsat Digital Data and Computer-Implemented Techniques for an Agricultural Application

*A. T. Joyce, R. H. Griffin II*

Agricultural applications procedures for use of Landsat digital data and other digitalized data.

NASA RP-1016
N78-21568 48 pp
Avail NTIS 1978

### Stratospheric Warmings: Synoptic, Dynamic and General-Circulation Aspects

*R. M. McInturff*

Distinction between major and minor warmings, the importance of tropospheric-stratospheric interaction, the significance of the pressure-work term near the tropopause.

NASA RP-1017
N78-18630 173 pp
Avail NTIS 1978

### Guide to a Condensed Form of NASTRAN

*J. L. Rogers, Jr.*

Limited capability form of NASTRAN level 16 to meet the needs of universities and small consulting firms. Can serve as a handbook for instructional courses in the use of NASTRAN or for users who need only the capability provided by the condensed form.

NASA RP-1019
N78-33791 297 pp
Avail NTIS 1978

### Precision Positional Data of General Aviation Air Traffic in Terminal Air Space

*W. E. Melson, Jr., L. C. Parker, A. M. Northam, et al.*

Three-dimensional radar tracks of general aviation air traffic at three uncontrolled airports.

NASA RP-1020
N78-25048 15 pp
Avail NTIS 1978

### A Bibliography on the Search for Extraterrestrial Intelligence

*E. F. Mallove, M. M. Connors, R. L. Forward, et al.*

A uniform compilation of works dealing with the search for extraterrestrial intelligence.

NASA RP-1021
N78-21019 135 pp
Avail NTIS 1978

DOCUMENT AVAILABLE

### Man's Impact on the Troposphere: Lectures in Tropospheric Chemistry

*J. S. Levine, D. R. Schryer*

Lectures covering a broad spectrum of current research in tropospheric chemistry, with particular emphasis on the interaction of measurements, modeling, and understanding of fundamental processes.

NASA RP-1022
N79-10634 371 pp
Avail NTIS 1978

### Synoptic Analyses, 5-, 2-, and 0.4-Millibar Surfaces for July 1974 Through June 1976

Meteorological rocketsonde and satellite radiance data employed for analyses of a continuing series of high altitude constant pressure charts.

NASA RP-1023
N78-28748 330 pp
Avail NTIS 1978

### Anthropometric Source Book

*E. Churchill, L. L. Laubach, J. T. McConville, et al.*

Volume 1. Anthropometry for Designers. Application of anthropometry to design of clothing, equipment, and workspaces for manned space flight.

NASA RP-1024
N79-11784 605 pp
Avail NTIS 1978

Volume 2. A Handbook of Anthropometric Data. Data from surveys of 61 populations; 295 measured variables.

NASA RP-1024
N79-18711 428 pp
Avail NTIS 1978

Volume 3. Annotated Bibliography of Anthropometry.

NASA RP-1024
N79-18712 180 pp
Avail NTIS 1978

### Handbook on Astronaut Crew Motion Disturbances for Control System Design in Skylab

*M. C. Kullas*

The analyses and results pertinent to the characterization of the disturbances imparted to the Skylab vehicle by the T-013 crew motion experiments.

NASA RP-1025
N79-27257 196 pp
Avail NTIS 1979

### An Assessment of the Effect of Supersonic Aircraft Operations on the Stratospheric Ozone Content

*I. G. Poppoff, R. C. Whitten, R. P. Turco, et al.*

An assessment of the potential effect on stratospheric ozone of an advanced supersonic transport operation using the most recent chemical reaction rate data.

NASA RP-1026
N78-30774 60 pp
Avail NTIS 1978

### A New Dimension. Wallops Island Flight Test Range: The First Fifteen Years

*J. A. Shortal*

A record of the first fifteen years (1945-1959) of research and development tests that were performed at Wallops Island.

NASA RP-1028
N79-20166 784 pp
Avail NTIS 1978

### The PR2D (Place, Route in 2-Dimensions) Automatic Layout Computer Program Handbook

*T. M. Edge*

NASA RP-1029
N79-71512 256 pp
Avail NTIS 1978

### Molecules of Significance in Planetary Aeronomy

*H. Mohan*

Spectroscopic information of the molecules of planetary interest. General conditions of planets and their atmospheres including the gaseous molecules.

NASA RP-1030
N79-22980 518 pp
Avail NTIS 1979

### Catalog of Far-Ultraviolet Objective-Prism Spectrophotometry: Skylab Experiment S-019, Ultraviolet Stellar Astronomy

*K. G. Henize, J. D. Wray, S. B. Parsons, et al.*

Approximately 1000 spectra representing 500 stars were measured and reduced to observed fluxes. Spectrophotometric results are tabulated for these 500 stars.

NASA RP-1031
N79-27057 343 pp
Avail NTIS 1979

DOCUMENT AVAILABLE

### Synoptic Analyses, 5-, 2-, 1-, and 0.4-Millibar Surfaces for July 1976 Through June 1977

Meteorological rocketsonde and satellite radiance data employed for analyses of a continuing series of high-altitude constant-pressure charts.

NASA RP-1032
N79-19569 226 pp
Avail NTIS 1978

### Convective Rainfall Estimation From Digital GOES-1 Infrared Data

*G. L. Sickler, A. H. Thompson*

An investigation to determine the feasibility of developing an objective technique for estimating convective rainfall from digital GOES-1 infrared data.

NASA RP-1034
N79-31885 96 pp
Avail NTIS 1979

### Survey and Bibliography on Attainment of Laminar Flow Control in Air Using Pressure Gradient and Suction

*D. M. Bushnell, M. H. Tuttle*

The survey, summaries of data for both ground and flight experiments, and abstracts of referenced reports.

NASA RP-1035
N79-33438 346 pp
Avail NTIS 1979

### ALSEP Termination Report

*J. R. Bates, W. W. Lauderdale, H. Kernaghan*

Description of experiments and pertinent operational history, data processing and distribution, significant scientific findings.

NASA RP-1036
N79-22979 161 pp
Avail NTIS 1979

### Collisionless Galaxy Simulations

*F. Hohl, T. A. Zang, J. B. Miller*

Computer experiments performed to determine the collapse and relaxation of initially spherical, uniform density and uniform velocity dispersion stellar systems.

NASA RP-1037
N79-24021 149 pp
Avail NTIS 1979

### Review and Status of Liquid-Cooling Technology for Gas Turbines

*G. J. Vanfossen, Jr., F. S. Stepka*

Liquid-cooled systems, [illegible] methods, assessment of the current technology status and requirements, comprehensive bibliography.

NASA RP-1038
N79-2[illegible] 81 pp
Avail NTIS 1979

### Synthetic Aperture Radar/Landsat MSS Image Registration

*H. E. Maurer, J. D. Oberholtzer, P. E. Anuta*

Algorithms and procedures necessary to merge aircraft synthetic aperture radar (SAR) and Landsat multispectral scanner (MSS) imagery, design of a SAR/Landsat data merging system.

NASA RP-1039
N80-16405 233 pp
Avail NTIS 1979

### NASA JSC Water Monitor System: City of Houston Field Demonstration

*R. E. Taylor, E. L. Jeffers, D. H. Fricks*

A water quality monitoring system with on-line and real time operation similar to the function in a spacecraft was investigated. Two major points were demonstrated: (1) the water monitor system has great potential in water monitoring and/or process control applications; and (2) the water monitor system represents a vast improvement over conventional (grab sample) water monitoring techniques.

NASA RP-1041
N79-28062 [illegible] pp
Avail NTIS 1979

### Performance Evaluation Method for Dissimilar Aircraft Design Using the Square of the Wing Span for Non-dimensional Comparisons of Aerodynamic Characteristics

*H. J. Walker*

A rationale for using the square of the wingspan rather than the wing reference area as a basis for nondimensional comparisons of the aerodynamic and performance characteristics of aircraft that differ substantially in platform and loading.

NASA RP-1042
N79-30139 72 pp
Avail NTIS 1979

### Processing of On-Board Recorded Data for Quick Analysis of Aircraft Performance—Rotor Systems Research Aircraft

*N. H. Michaud*

A system of independent computer programs for the processing of digitized pulse code modulated and frequency modulated data.

NASA RP-1043
N79-33191 [illegible] pp
Avail NTIS 1979

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### Wind Study for High Altitude Platform Design

*T. W. Strganac*

An analysis of upper air winds to define the wind environment at potential operating altitudes for high altitude powered platform concepts.

NASA RP-1044
N80-12661 288 pp
Avail NTIS 1979

### The Physiological Basis for Spacecraft Environmental Limits

*J. M. Waligora*

Limits for operational environments in terms of acceptable physiological changes: contaminants, temperature, acceleration, noise, rf radiation, and weightlessness.

NASA RP-1045
N80-15788 229 pp
Avail NTIS 1979

### Measurement of Aircraft Speed and Altitude

*W. Gracey*

Problems involved in measuring speed and altitude with pressure-actuated instruments (altimeter, airspeed indicator, true-airspeed indicator, Machmeter, and vertical-speed indicator).

NASA RP-1046
N80-24296 311 pp
Avail NTIS 1980

### Measurement Techniques for Trace Metals in Coal-Plant Effluents: A Brief Review

*J. J. Singh*

The strong features and limitations of techniques for determining trace elements in aerosols emitted from coal plants.

NASA RP-1047
N79-33611 54 pp
Avail NTIS 1979

### Procedure for Extraction of Disparate Data From Maps Into Computer Data Bases

*B. G. Junkin*

A procedure for extracting disparate sources of data from geographic maps, and for the conversion of these data into a suitable format for processing on a computer-oriented information system.

NASA RP-1048
N79-33838 25 pp
Avail NTIS 1979

### The Stratosphere: Present and Future

*R. D. Hudson, E. I. Reed*

The three basic elements of stratospheric science-laboratory measurements, atmospheric observations, and theoretical studies.

NASA RP-1049
N80-14641 443 pp
Avail NTIS 1979

### Classical Aerodynamic Theory

*R. T. Jones*

Theories of incompressible potential flow and research on the aerodynamic forces on wing and wing sections of aircraft and on airship hulls.

NASA RP-1050
N80-15033 308 pp
Avail NTIS 1979

### Thermodynamic Properties of Nitrogen Gas Derived From Measurements of Sound Speed for Cryogenic Wind Tunnels

*B. Younglove, R. D. McCarty*

A virial equation of state for nitrogen was determined by use of newly measured speed-of-sound data and existing pressure-density-temperature data in a multiproperty-fitting technique.

NASA RP-1051
N80-14257 56 pp
Avail NTIS 1979

### Sealed-Cell Nickel-Cadmium Battery Applications Manual

*W. R. Scott, D. W. Rusta*

The design, procurement, testing, and application of aerospace quality, hermetically sealed nickel-cadmium cells and batteries.

NASA RP-1052
N80-16095 533 pp
Avail NTIS 197

### Results of the August 1977 Soviet and American Meteorological Rocketsonde Intercomparison Held at Wallops Island, Virginia

*F. J. Schmidlin, J. R. Duke, A. I. Ivanovsky, et al.*

A coordinated program of rocketsonde investigations along about 60° E and 70° W between the United States and U.S.S.R.

NASA RP-1053
N80-16082 193 pp
Avail NTIS 1980

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## Thunderstorm-Environment Interactions Determined With Three-Dimensional Trajectories

*G. S. Wilson*

Diagnostically determined three dimensional trajectories were used to reveal some of the scale interaction processes that occur between convective storms and their environment.

NASA RP-1054
N80-16675 163 pp
Avail NTIS 1980

## Some Human Factors Issues in the Development and Evaluation of Cockpit Alerting and Warning Systems

*R. J. Randle, Jr., W. E. Larsen, D. H. Williams*

A set of general guidelines for evaluating newly developed cockpit alerting and warning system in terms of human factors issues.

NASA RP-1055
N80-15821 65 pp
Avail NTIS 1980

## Orbiter Landing Loads Math Model Description and Correlation With ALT Flight Data

*D. A. Hamilton, J. A. Schliesing, G. A. Zupp, Jr.*

Results of the Space Shuttle approach and landing test to assess landing gear characteristics and performance and to verify landing dynamic analyses.

NASA RP-1056
N80-16091 27 pp
Avail NTIS 1980

## Handbook of Lunar Materials

*R. J. Williams, J. J. Jadwick*

The physical, chemical, thermodynamic, and geologic data of lunar rocks, minerals, and processes.

NASA RP-1057
N80-16009 133 pp
Avail NTIS 1980

## Stratospheric Aerosol Modification by Supersonic Transport Operations With Climate Implications

*O. B. Toon, R. P. Turco, J. B. Pollack, et al.*

The potential effects on stratospheric aerosols of supersonic transport emissions of sulfur dioxide gas and submicron size soot granules.

NASA RP-1058
N80-15726 20 pp
Avail NTIS 1980

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### Proceedings of the SCAR Conference

Aerodynamics, stability and control, propulsion, environmental factor, airframe structures and materials, design integration.

Part 1
NASA CP-1
N77-17996 478 pp
Avail NTIS 1976

Part 2
NASA CP-1
N77-18019 547 pp
Avail NTIS 1976

### The Structure and Content of the Galaxy and Galactic Gamma Rays

*C. E. Fichtel, F. W. Stecker*

Gamma radiation investigations by COS-B and SAS-2 satellites, data from CO surveys of the galaxy and the galactic distribution of pulsars, theories of galactic gamma ray emission.

NASA CP-2
N77-20977 556 pp
Avail NTIS 1977

### Systems Reliability Issues for Future Aircraft

Reliability of adaptive controls for future aircraft.

NASA CP-3
N77-22808 212 pp
Avail NTIS 1975

### Inversion Methods in Atmospheric Remote Sounding

*A. Deepak*

The mathematical theory of inversion methods applied to the remote sounding of atmospheric temperature, humidity, and aerosol constituents.

NASA CP-4
N78-12386 609 pp
Avail NTIS 1977

### The Use of Nonhuman Primates in Space

*R. C. Simmonds, G. H. Bourne*

Space related biomedical research involving nonhuman primates. Conference, December 1974.

NASA CP-5
N78-11665 590 pp
Avail NTIS 1977

### Application of Remote Sensing to the Chesapeake Bay Region

*W. T. Chen, G. W. Freas, Jr., G. D. Hickman, et al.*

Part 1. Executive Summary
NASA CP-6
N78-23537 47 pp
Avail NTIS 1978

Part 2. Proceedings
NASA CP-6
N78-23526 388 pp
Avail NTIS 1978

### Fourth NASA Inter-Center Control Systems Conference

Space vehicle control applications; aircraft guidance, control, and handling qualities. Conference, November 1969.

NASA CP-7
N78-23010 504 pp
Avail NTIS 1978

### Advances in Engineering Science

Volume 1. Materials science, fracture mechanics, impact and vibration testing.

NASA CP-2001
N77-10230 560 pp
Avail NTIS 1976

Volume 2. Structural dynamics.

NASA CP-2001
N77-10265 457 pp
Avail NTIS 1976

Volume 3. Acoustics, environmental modeling, energy technology.

NASA CP-2001
N77-10305 464 pp
Avail NTIS 1976

Volume 4. Inviscid flow, viscous flow, aircraft aerodynamics, fluid mechanics, propulsion and combustion, flight dynamics and control.

NASA CP-2001
N77-10345 521 pp
Avail NTIS 1976

### Flight Mechanics/Estimation Theory Symposium

*A. Fuchs*

Computation of relative motion, rapid satellite life-time estimation, mission analysis system design, satellite attitude prediction.

NASA CP-2002
N78-76855 265 pp
Avail NASA HERO 1975

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### Free Drifting Buoys

Tracking systems and techniques; deployment and retrieval; simulation, sensors, and data; recent experience and plans.

NASA CP-2003
N77-16675 378 pp
Avail NTIS 1974

### Atmospheric Aerosols: Their Optical Properties and Effects

Computations based on thermodynamic equilibrium and Mie theory.

NASA CP-2004
N77-15563 316 pp
Avail NTIS 1976

Supplement. Digest of technical papers.

NASA CP-2004
N77-15564 46 pp
Avail NTIS 1976

### Aircraft Piston Engine Exhaust Emission Symposium

Emission measurement problems, data reduction procedures, flight testing, emission reduction techniques.

NASA CP-2005
N77-17081 373 pp
Avail NTIS 1976

### Proceedings and Findings of 1976 Workshop on Ride Quality—Passenger Acceptance of Transportation Systems

*A. R. Kuhlthau*

NASA CP-2006
N77-27710 86 pp
Avail NTIS 1976

### Ninth Conference on Space Simulation

Spacecraft testing; facilities and test equipment; system and subsystem test; life sciences, medicine, and space; physical environmental factors; chemical environmental factors; contamination; space physics; thermal protection.

NASA CP-2007
N79-19013 470 pp
Avail NTIS 1977

### High Reynolds Number Research

*D. D. Baals*

Fundamental aerodynamics questions for which high Reynolds number experimental capability is required; design features of the NASA Langley Transonic Facility.

NASA CP-2009
N77-27139 185 pp
Avail NTIS 1977

### Terrestrial Photovoltaic Measurements

Terrestrial solar irradiance, solar simulation and reference cell calibration, cell and array measurement procedures.

NASA CP-2010
N77-30521 393 pp
Avail NTIS 1976

### Proceedings of the 1977 MACSYMA Users' Conference

Technical aspects of MACSYMA, a large symbolic and algebraic system.

NASA CP-2012
N77-28750 596 pp
Avail NTIS 1977

### Summary Report: Workshop on Vehicle Ride Quality

*A. R. Kuhlthau, A. W. Wichansky*

Procedures to optimize urban transportation with emphasis on vehicle ride quality. Workshop, August 1975.

NASA CP-2013
N78-11705 167 pp
Avail NTIS 1977

### Essays on the History of Rocketry and Astronautics: Proceedings of the Third Through the Sixth History Symposia of the International Academy of Astronautics

*R. C. Hall*

Early solid propellant rocketry, rocketry and astronautics after 1880, development of liquid and solid propellant rockets from 1880 to 1945, rocketry and astronautics after 1945. Symposia, October 1969, October 1970, September 1971, October 1972.

Volume 1

NASA CP-2014
N77-33030 244 pp
Avail GPO 1977

Volume 2

NASA CP-2014
N77-33048 476 pp
Avail GPO 1977

### Standardization, Certification, Maintenance, and Dissemination of Large-Scale Engineering Software Systems

*T. G. Toridis, H. G. McComb, Jr., K. Khozeimeh*

NASA CP-2015
N77-33876 103 pp
Avail NTIS 1977

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### Lean Premixed/Prevaporized Combustion

*A. H. Lefebvre*

Recommendations on the status and application of lean premixed/prevaporized combustion to the aircraft gas turbine for the reduction of pollutant emissions.

NASA CP-2016
N77-33297 46 pp
Avail NTIS 1977

### An Assessment of Technology for Turbojet Engine Rotor Failures

*E. A. Witmer*

Design considerations, objectives, and approaches in containing rotor burst debris; methods for determining the fracture resistance of various materials used in providing lightweight shielding from fragment impact.

NASA CP-2017
N78-10068 425 pp
Avail NTIS 1977

### Sixth NASTRAN Users' Colloquium

NASTRAN programming and substructuring methods, fluids and thermal applications.

NASA CP-2018
N78-12445 473 pp
Avail NTIS 1977

### Proceedings of the ASPE/MSFC Symposium on Engineering and Productivity Gains From Space Technology

Aerospace technology findings in regard to nonaerospace applications, energy generation, materials and processes, Earth observation, advances and benefits of electronics.

NASA CP-2019
N77-30273 279 pp
Avail NTIS 1977

### Solar Cell High Efficiency and Radiation Damage

Silicon solar cell analysis and fundamental measurements, silicon cell technology, gallium arsenide research and technology, radiation effects on silicon and gallium arsenide cells.

NASA CP-2020
N78-13527 221 pp
Avail NTIS 1977

### Aircraft Engine Emissions

Components, controls, energy efficient engine designs, noise and pollution reduction.

NASA CP-2021
N78-11065 452 pp
Avail NTIS 1977

### NASA Workshop on Solar-Terrestrial Studies From a Manned Space Station

The mechanism of the solar radiation and its effect on the environment, instrumentation requirements in the exploration of the solar and terrestrial system.

NASA CP-2024
N77-32549 42 pp
Avail NTIS 1977

### Agricultural Aviation Research

*H. L. Chevalier, L. F. Bouse*

The current state of the art of agricultural aviation, potentially productive short and long range research and development areas, communications between research scientists and engineers involved in agricultural research.

NASA CP-2025
N78-12999 151 pp
Avail NTIS 1977

### AIAA/MSFC Symposium on Space Industrialization: Proceedings

Current and projected technologies required for utilizing extraterrestrial environments to produce energy, information, or materials and provide services of value on Earth or to Earth.

NASA CP-2026
N78-18088 627 pp
Avail NTIS 1976

### Proceedings of the 1977 NASA/ISHM Microelectronics Conference

*S. V. Caruso*

Current and future requirements for research development, manufacturing, and education in the field of hybrid microelectronic technology.

NASA CP-2027
N78-16266 170 pp
Avail NTIS 1977

### Proceedings of the First Annual Meteorological and Environmental Inputs to Aviation Systems Workshop

*D. W. Camp, W. Frost*

Aircraft design, simulation, and general aviation.

NASA CP-2028
N78-19711 535 pp
Avail NTIS 1977

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### Third National Aeronautics and Space Administration Weather and Climate Program Science Review

*E. R. Kreins*

Research results of developing experimental and prototype operational systems, sensors, and space facilities for monitoring and understanding the atmosphere.

NASA CP-2029
N79-20575 304 pp
Avail NTIS 1977

### Active Microwave Users Workshop Report

*R. E. Matthews*

Seasat land experiments, program planning, synthetic aperture radar data processing, applications.

NASA CP-2030
N78-21562 300 pp
Avail NTIS 1978

### Summer Workshop on Near-Earth Resources

*J. R. Arnold, M. B. Duke*

The possible large scale use of extraterrestrial resources to construct structures in space or to return to Earth as supplements for terrestrial resources.

NASA CP-2031
N78-16973 107 pp
Avail NTIS 1978

### Future Computer Requirements for Computational Aerodynamics

Recent advances in computational aerodynamics, potential benefits of a national aerodynamic simulation facility.

NASA CP-2032
N78-19778 515 pp
Avail NTIS 1978

### Jet Aircraft Hydrocarbon Fuels Technology

*J. P. Longwell*

Prediction of tradeoffs among fuel refining, distribution, and aircraft operating costs; combustor liner temperature and emissions studies; and practical simulator investigations of the effect of high freezing point and low thermal stability fuels on aircraft fuel systems.

NASA CP-2033
N78-19325 64 pp
Avail NTIS 1978

### Wind Turbine Structural Dynamics

*D. R. Miller*

Methods for calculating dynamic loads, aeroelasticity stability, wind loads, both steady and transient, critical design conditions, drive train dynamics, behavior of operating wind turbines.

NASA CP-2034
N78-19616 280 pp
Avail NTIS 1978

### Large Space Systems Technology

*E. C. Naumann, A. Butterfield*

Mission requirements, structural concepts, materials, structural alignment, thermal control, metrology, technological forecasting.

Volume 1
NASA CP-2035
N79-10078 540 pp
Avail NTIS 1978

Volume 2
NASA CP-2035
N79-10097 505 pp
Avail NTIS 1978

### CTOL Transport Technology, 1978

Part 1. Aircraft propulsion, structures and materials, laminar flow control.

NASA CP-2036
N78-27046 516 pp
Avail NTIS 1978

Part 2. Advanced aerodynamics and active controls, operations, and safety, advanced systems, energy efficiency.

NASA CP-2036
N78-29046 405 pp
Avail NTIS 1978

### Guntersville Workshop on Solar-Terrestrial Studies

The effects of solar activity on geomagnetic activity; instrument requirements for interdisciplinary joint observational studies of the magnetosphere, the atmosphere, Sun-weather relationships.

NASA CP-2037
N78-19600 71 pp
Avail NTIS 1977

### The 11th Aerospace Mechanisms Symposium

Spacecraft and missile components such as tail assemblies, radiometers, magnetometers.

NASA CP-2038
N79-21374 243 pp
Avail NTIS 1977

AVAILABLE

### Proceedings of the USAF/NASA International Spacecraft Contamination Conference

*J. M. Jemiola*

Spacecraft modeling, determination of basic material properties, thruster plume characteristics and modeling, contamination prevention and control, contamination kinetics and effects.

NASA CP-2039
N79-25048 1219 pp
Avail NTIS 1978

### The MSFC/UAH Data Management Symposium

*A. Castelli*

NASA CP-2040
N78-74659 423 pp
Avail NTIS 1978

### The 1977 Goddard Space Flight Center Battery Workshop

Results of testing, analysis, and development of the sealed nickel cadmium cell system.

NASA CP-2041
N79-21565 579 pp
Avail NTIS 1977

### Emerging Energy Alternatives for the Southeastern States

*E. K. Stefanakos*

Solar energy, wood energy, novel energy sources, agricultural and industrial process heat, waste utilization, energy conservation, ocean thermal energy conversion.

NASA CP-2042
N78-28615 149 pp
Avail NTIS 1978

### Stratcom 8 Data Workshop and Supplement

*E. L. Reed*

The study of stratospheric photochemistry involving ozone, with secondary objectives including a study of the balloon environment, comparison of independent techniques for the measurement of $O_3$ and NO, development of new sensor systems.

NASA CP-2043
N79-25461 137 pp
Avail NTIS 1978

### Planning for Airport Access: An Analysis of the San Francisco Bay Area

*J. S. Dajani, J. V. Jucker, J. L. Jones*

A description of the airport area, its current transportation capabilities, recommendations for future access planning.

NASA CP-2044
N79-10942 300 pp
Avail NTIS 1978

### Advanced Technology Airfoil Research

Comprehensive review of airfoil research, development of computational aerodynamic codes for airfoil analysis and design, development of experimental facilities and test techniques, airfoil applications.

Volume 1, Part 1
NASA CP-2045
N79-20030 454 pp
Avail NTIS 1979

Volume 1, Part 2
NASA CP-2045
N79-19989 303 pp
Avail NTIS 1978

Volume 2
NASA CP-2046
N80-21283 262 pp
Avail NTIS 1979

### Research Efforts in Aircraft Pollution

Emissions regulations, combustor modeling, combustor development, instrumentation, emission measurement, airport/airbase pollution, upper atmospheric pollution and chemistry.

NASA CP-2048 124 pp
X78-10171 1978

### Proceedings of the NASA/Florida Institute of Technology Environmental Engineering Conference on Nitrogen Tetroxide With Emphasis on Space Shuttle

*E. L. Rhodes*

Methods of reducing the user hazards of nitrogen tetroxide, Kennedy Space Center developments in $N_2O_4$ control for the Space Shuttle, life support equipment and transportation.

NASA CP-2049
N79-20424 203 pp
Avail NTIS 1978


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### Flight Mechanics/Estimation Theory Symposium

Satellite attitude determination and control, orbit determination, onboard and ground attitude determination procedures, effect of atmosphere on Venus orbiter navigation, satellite-to-satellite tracking, satellite onboard navigation using global positioning system data.

NASA CP-2050
N79-14121 289 pp
Avail NTIS 1978

### Hyperthermia as an Antineoplastic Treatment Modality

*S. A. T. Long, J. Shaeffer, A. M. El-Mahdi*

Preclinical evaluation of hyperthermia for treating tumorous cancers.

NASA CP-2051
N79-10728 96 pp
Avail NTIS 1978

### Helicopter Acoustics

Noise regulation concepts, design, operations and testing for noise control, helicopter noise prediction, research tools and measurements.

Part 1

NASA CP-2052
N78-32816 399 pp
Avail NTIS 1978

Part 2

NASA CP-2052
N79-10843 458 pp
Avail NTIS 1978

### Asteroids: An Exploration Assessment

*D. Morrison, W. C. Wells*

Current state of asteroid science, need for future space missions to gain more knowledge on asteroid relationship to solar system formation.

NASA CP-2053
N78-29007 295 pp
Avail NTIS 1978

### YF-12 Experiment Symposium, Volume 1

Propulsion system performance, inlet time varying distortion, structures, aircraft controls, propulsion controls, and aerodynamics.

NASA CP-2054
N78-32055 286 pp
Avail NTIS 1978

### YF-12 Experiments Symposium, Volume 2

NASA CP-2054 126 pp
1978

### YF-12 Experiments Symposium, Volume 3

NASA CP-2054 542 pp
1978

### Engineering and Scientific Data Management

The application of data management systems to engineering and scientific data.

NASA CP-2055
N78-33776 255 pp
Avail NTIS 1978

### Exploratory Meeting on Atmospheric Electricity and Severe Storms

*W. W. Vaughan*

Atmospheric electricity and its relationship to severe storms, the feasibility of developing a set of instruments for either a Space Shuttle or an unmanned satellite, the scientific rationale which would warrant further in-depth assessment, involvement and development of supporting activities by NASA.

NASA CP-2056
N78-29669 30 pp
Avail NTIS 1978

### Proceedings of the 2nd Annual Workshop on Meteorological and Environmental Inputs to Aviation Systems

*W. Frost, D. W. Camp, D. E. Durham*

The major objectives of the workshop were to satisfy such needs of the sponsoring agencies as the expansion of understanding and knowledge of the interactions of the atmosphere with aviation systems, the better definition and implementation of services to operators, and the collection and interpretation of data for establishing operational criteria.

NASA CP-2057
N79-17413 259 pp
Avail NTIS 1978

### Future Orbital Power Systems Technology Requirements

Comment on current and planned programs and opportunities for technology investment.

NASA CP-2058
N79-10122 195 pp
Avail NTIS 1978

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### Research in Computerized Structural Analysis and Synthesis

*H. G. McComb, Jr.*

Computer applications in dynamic structural analysis and structural design modeling.

NASA CP-2059
N79-10448 224 pp
Avail NTIS 1978

### The 14th Annual Conference on Manual Control: Digital Simulation of Human Operator Dynamics

Human operator dynamics during actual manual control or while monitoring the automatic control systems involved in air-to-air tracking, automobile driving, the operator of undersea vehicles, remote handling.

NASA CP-2060
N79-15588 692 pp
Avail NTIS 1978

### Avionics and Controls Research and Technology

*H. A. Rediess, D. E. McIver*

Technology needs and opportunities, the role of NASA in avionics and controls research.

NASA CP-2061
N79-15898 84 pp
Avail NTIS 1979

### Seventh NASTRAN User's Colloquium

Fluids and thermal applications, NASTRAN programming, substructuring methods, unique new applications, general auxiliary programs, specific applications, new capabilities.

NASA CP-2062
N78-32466 499 pp
Avail NTIS 1978

### Human Neurological Development: Past, Present and Future

*R. Pelligra*

Vision; vestibular function; intelligence; nutrition; treatment of neurological disfunctions, coma, and convulsive seizures.

NASA CP-2063
N79-15887 60 pp
Avail NTIS 1978

### Tools for Embedded Computing Systems Software

Tools and the software environment; tools and software requirements, design, and specification; tools and language processors; tools and verification and validation.

NASA CP-2064
N79-15756 157 pp
Avail NTIS 1978

### Recent Advances in Structures for Hypersonic Flight

Engine structures, cooled airframe structures, hot structures, thermal protection systems, cryogenic tankage structures, cryogenic insulation, analysis of thermal structures.

Part 1
NASA CP-2065
N79-21422 533 pp
Avail NTIS 1978

Part 2
NASA CP-2065
N79-21435 408 pp
Avail NTIS 1978

### Ozone Contamination in Aircraft Cabins

The problem and solution to the physical ozone irritation caused by ozone concentrations in the cabins of high-altitude aircraft.

NASA CP-2066
N79-21021 81 pp
Avail NTIS 1979

### The Rotary Engine: A Candidate for General Aviation

Nonturbine engine research programs for general aviation, future requirements for general aviation powerplants.

NASA CP-2067
N79-15961 190 pp
Avail NTIS 1978

### The Saturn System

*D. M. Hunten, D. Morrison*

Mission planning for orbiter and entry probes of the Saturn system emphasizes scientific studies of Saturn, its satellites, its rings, and its magnetosphere.

NASA CP-2068
N79-16758 423 pp
Avail NTIS 1978

### Proceedings of the Workshop on an Electromagnetic Positioning System in Space

*W. A. Oran*

Study of metallic glasses, investigations of the properties of high temperature materials.

NASA CP-2069
N79-13069 25 pp
Avail NTIS 1978

### Radar, Insect Population Ecology, and Pest Management

*C. R. Vaughn, W. Wolf, W. Klassen*

The potential role of radar in insect ecology studies and pest management and phenomena with insect movement.

NASA CP-2070
N79-19592 252 pp
Avail NTIS 1979



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### Spacecraft Charging Technology, 1978

The interaction of the aerospace environment with spacecraft surfaces and onboard, high voltage spacecraft systems operating over a wide range of altitudes from low Earth orbit to geosynchronous orbit.

NASA CP-2071
N79-24001 908 pp
Avail NTIS 1979

### Second International Colloquium on Mars: Abstracts for a Colloquium

NASA CP-2072
N79-16757 97 pp
Avail NTIS 1979

### Soil Moisture Workshop

*J. L. Heilman, D. G. Moore, T. J. Schmugge, et al.*

The objectives of the workshop were to evaluate the state of the art of remote sensing of soil moisture, examine the needs of potential users, and make recommendations concerning the future of soil moisture research and development.

NASA CP-2073
N79-16329 219 pp
Avail NTIS 1978

### Carbon Fiber Risk Analysis

The scope and status of the effort to assess the risks associated with the accidental release of carbon/graphite fibers from civil aircraft.

NASA CP-2074
N79-22196 245 pp
Avail NTIS 1979

### Government/Industry Workshop on Payload Loads Technology

The problems of balancing the design criteria between launch and orbit operations and developing analytical techniques that are reliable, accurate, efficient, and low cost.

NASA CP-2075
N79-20162 874 pp
Avail NTIS 1978

### Fourth National Aeronautics and Space Administration Weather and Climate Program Science Review

*E. R. Kreins*

Scientific research on severe storms and local weather, global weather, and climate.

NASA CP-2076
N79-20633 396 pp
Avail NTIS 1979

### Quiet Powered-Lift Propulsion

New propulsion technology for powered-lift aircraft systems.

NASA CP-2077
N80-15127 426 pp
Avail NTIS 1979

### Premixed Prevaporized Combustor Technology Forum

Engine interfaces, fuel-air preparation, autoignition, lean combustion, concept design studies.

NASA CP-2078
N79-24994 262 pp
Avail NTIS 1979

### Graphite/Polyimide Composites: Conference on Composites for Advanced Space Transportation Systems

*H. B. Dexter, J. G. Davis, Jr.*

Fabrication, adhesives, test methods, structural integrity, design and analysis, advanced technology developments, high temperature polymer research, the state of the art of graphite/polyimide composites.

NASA CP-2079
N79-30297 449 pp
Avail NTIS 1979

### The 12th Aerospace Mechanisms Symposium

Boom release mechanisms, separation on Space Shuttle orbiter/Boeing 747 aircraft, payload handling, spaceborne platform support, deployment of spaceborne antennas and telescopes.

NASA CP-2080
N79-21352 241 pp
Avail NTIS 1979

### The 13th Aerospace Mechanisms Symposium

*A. C. Bond*

Propulsion; motion compensation; instrument pointing and adjustment; centrifuge testing; bearing design; vehicle braking; cargo handling; devices for satellite, missile, and hypersonic-wind-tunnel applications; space shuttle mechanical and thermal protection systems; techniques for building large space structures.

NASA CP-2081
N79-22539 300 pp
Avail NTIS 1979

### Flight Mechanics/Estimation Theory Symposium With Application to Autonomous Navigation and Attitude/Orbit Determination

*A. J. Fuchs*

Landsat landmark data, star sensing and pattern recognition, filtering algorithms for global positioning system, determining orbital elements for geostationary satellites.

NASA CP-2082
N79-26082 347 pp
Avail NTIS 1979

### Laser Doppler Velocimetry Workshop

*R. B. Owen*

The potential of laser Doppler velocimetry as a technique for use in mapping flows in the several fluid systems under development for doing research on low-gravity processes.

NASA CP-2084
N79-22455 12 pp
Avail NTIS 1979

### The Science and Technology of Low Speed and Motorless Flight

*P. W. Hanson*

Low speed aerodynamics, new materials applications and structural concepts, advanced flight instrumentation, sailplane optimal flight techniques, self-launching and ultralight glider technology.

Part 1
NASA CP-2085
N79-23889 299 pp
Avail NTIS 1979

Part 2
NASA CP-2085
N79-27070 297 pp
Avail NTIS 1979

### Aircraft Icing

*B. J. Blaha*

NASA CP-2086
N79-23912 147 pp
Avail NTIS 1979

### Fundamentals of Gas Turbine Combustion

*M. Gerstein*

Atomization and vaporization, combustion chemistry, combustion dynamics, combustion modeling.

NASA CP-2087
N79-25016 52 pp
Avail NTIS 1979

### The 11th Annual Battery Workshop

The development, properties, and testing of nickel cadmium, metal hydrogen, and lithium systems.

NASA CP-2088
N79-28669 545 pp
Avail NTIS 1978

### Space Missions to Comets

*M. Neugebauer, D. K. Yeomans, J. C. Brandt, et al.*

The broad impact of a cometary mission with particular emphasis on scientific interest in a fly-by mission to Halley's comet and a rendezvous with Tempel 2.

NASA CP-2089
N80-11972 229 pp
Avail NTIS 1979

### Middle Atmosphere Electrodynamics: Report of the Workshop on the Role of the Electrodynamics of the Middle Atmosphere on Solar Terrestrial Coupling

*N. C. Maynard*

Review of the status of middle atmosphere electrodynamics and recommendations for future research.

NASA CP-2090
N79-25608 268 pp
Avail NTIS 1979

### Proceedings of Workshops to Define Engineering Requirements for a Space Vacuum Research Facility

*W. A. Oran, S. T. Wu, R. W. Hoffman*

The construction of a molecular wake shield for the Shuttle orbiter, a collision model with a program depicting emitted molecular density around the spacecraft.

NASA CP-2091
N79-26076 152 pp
Avail NTIS 1979

### Aeropropulsion 1979

State-of-the-art technology in aeronautical propulsion noise and air pollution control techniques, advances in supersonic propulsion for transport aircraft, composite materials and structures for reliable engine components, engine design for improved fuel consumption.

NASA CP-2092
N80-10205 464 pp
Avail NTIS 1979



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### Workshop on Thrust Augmenting Ejectors

*A. E. Lopez, D. G. Koenig, D. S. Green, et al.*

The state of the art of ejector technology and the direction of future studies.

NASA CP-2093
N80-10107 509 pp
Avail NTIS 1979

### Conference on Fire Resistant Materials: A Compilation of Presentations and Papers

*D. A. Kourtides, G. A. Johnson*

Large-scale testing, fire toxicology, polymeric materials, fire modeling.

NASA CP-2094
N79-31166 287 pp
Avail NTIS 1979

### Proceedings: Workshop on the Need for Lightning Observations From Space

*L. S. Christensen, W. Frost, W. W. Vaughan*

Satellite instrumentation specifically designed for indicating the characteristics of lightning are of value in severe storms research, in engineering and operational problem areas, and in providing information on atmospheric electricity and its role in meteorological processes.

NASA CP-2095
N79-30869 255 pp
Avail NTIS 1979

### Implications of Fuel-Efficient Vehicles on Ride Quality and Passenger Acceptance

*A. M. Wichansky, A. R. Kuhlthau*

Ride quality and passenger acceptance problems associated with enhanced fuel efficiency of automobiles and aircraft, shifts in intermediate range (100-500 miles) travel from automobiles to public transit.

NASA CP-2096
N80-18090 120 pp
Avail NTIS 1979

### Solar Cell High Efficiency and Radiation Damage, 1979

Progress in the effort to increase the end-of-life efficiency of solar cells for space use, silicon solar cell efficiency, radiation effects, gallium arsenide cells.

NASA CP-2097
N79-32640 290 pp
Avail NTIS 1979

### Study of the Solar Cycle From Space

The objectives of and benefits to be derived from a program of solar cycle research, the role of space observations, including crucial missions, experiments, and the theoretical advances.

NASA CP-2098
N80-17944 366 pp
Avail NTIS 1980

### Earth Radiation Budget Science

Climate modeling, climate diagnostics, radiation modeling, radiation variability and correlation studies, cloudiness and the radiation budget, and radiation budget and related measurements in 1985 and beyond.

NASA CP-2100
N79-32797 79 pp
Avail NTIS 1978

### Flight Technology Improvement—Spaceborne Optical Radiometric Instruments, Attitude Control, and Electromechanical and Power Subsystems

Optical radiometric instruments and calibration, attitude control and determination, electromechanical and power subsystem.

NASA CP-2101
N80-13152 76 pp
Avail NTIS 1979

### Conference of Remote Sensing Educators (CORSE-78)

Methods of improving the teaching of remote sensing, Earth resources, image interpretation, data processing concepts.

NASA CP-2102
N80-20003 664 pp
Avail NTIS 1978

### Models of Human Operators in Vision Dependent Tasks

*M. C. Waller*

Descriptive overviews of some existing models, and techniques of modeling the human operator.

NASA CP-2103
N79-33838 86 pp
Avail NTIS 1979

### Proceedings: Third Annual Workshop on Meteorological and Environmental Inputs to Aviation Systems

*D. W. Camp, W. Frost*

Training, flight operations, accident investigation, air traffic control, airports, winds and wind shear, icing and frost, atmospheric electricity and lightning, fog, visibility, ceilings, turbulence.

NASA CP-2104
N80-14633 190 pp
Avail NTIS 1979

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**Summary of the NASA/MSFC FY-79 Severe Storm and Local Weather Research Review—Cloud Physics, Atmospheric Electricity, and Mesoscale/Storm Dynamics Research**

NASA CP-2105
N79-33722 92 pp
Avail NTIS 1979

**Large Wind Turbine Design Characteristics and R&D Requirements**

*S. Lieblein*

Large wind turbine research and development.

NASA CP-2106
N80-16453 459 pp
Avail NTIS 1979

**Nuclear-Pumped Lasers—Efficient Conversion of Energy Liberated in Nuclear Reactions to Coherent Radiation**

Nuclear-pumped laser modeling, nuclear volume and foil excitation of laser plasmas, proton beam simulations, nuclear flashlamp excitation, reactor laser systems studies.

NASA CP-2107
N80-13438 140 pp
Avail NTIS 1979

**Supersonic Cruise Research 1979**

Part 1
NASA CP-2108
X80-72343 538 pp
1980

Part 2
NASA CP-2108
X80-72367 408 pp
1980

**Remote Sensing and Problems of the Hydrosphere**

*E. D. Goldberg*

The classification of lakes, identification and quantification of major functional groups of phytoplankton, sources and sinks of biochemical factors, and temporal and regional variability of surface features, atmospheric processes linked to hydrospheric process through the transfer of matter via aerosols and gases, particle fluxes to the aquatic environment, global geochemical problems.

NASA CP-2109
N80-12718 67 pp
Avail NTIS 1979

**Proceedings of Shuttle Environmental Effects Program Review**

*A. E. Potter*

Measurements of Titan exhaust cloud effluents, mesoscale and microphysical acid rain models, proposed submesoscale model, regional air quality monitoring and rain collection systems, ecological impact of solid rocket motor exhaust effluents.

NASA CP-2110
N80-15649 124 pp
Avail NTIS 1980

**Scientific Research With the Space Telescope: International Astronomical Union Colloquium No. 54**

*M. S. Longair, J. W. Warner*

Investigations of small solar system objects, the physical characteristics of ionized gaseous nebulae, the central regions of active galaxies and quasars, problems of cosmology, the distribution and composition of interstellar matter.

NASA CP-2111
N80-22130 331 pp
Avail NTIS 1979

**Preliminary Applications and Evaluation Results. Lixiscope: Proceedings of the Lixiscope Conference**

The principle of the lixiscope and its potential uses in industry, clinical medicine, and astrophysics.

NASA CP-2112
N80-12384 89 pp
Avail NTIS 1978

**HEAO Science Symposium**

*C. Dailey, W. Johnson*

X-ray variability, extragalactic astronomy, x-ray ion line emission, optical identification and spectroscopy of x-ray sources, results from HEAO 2 imaging and nonimaging instruments.

NASA CP-2113
N80-14977 463 pp
Avail NTIS 1979

**Validation Methods for Fault-Tolerant Avionics and Control Systems**

The state of the art in fault tolerant computer validation.

NASA CP-2114
N80-12741 112 pp
Avail NTIS 1979


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### Radio Interferometry: Techniques for Geodosy

Progress in the development and application of radio interferometry as a tool for geophysical research.

NASA CP-2115
N80-28798 472 pp
Avail NTIS 1980

### Operational Applications of Satellite Snowcover Observations

*A. Rango, R. Peterson*

The history of remote sensing of snow cover, techniques for interpreting Landsat and NOAA satellite data, the status of future systems for continuing snow hydrology applications, the use of snow cover observations in streamflow forecasts by applications systems verification and transfer participants and selected foreign investigators, the benefits of using satellite snow cover data in runoff prediction.

NASA CP-2116
N80-25742 294 pp
Avail NTIS 1980

### The 1979 Goddard Space Flight Center Battery Workshop

*G. Halpert*

Results of testing, analysis, and development of the sealed nickel cadmium cell system, metal hydrogen and lithium cell technology and applications.

NASA CP-2117
N80-20820 521 pp
Avail NTIS 1980

### Large Space Systems Technology, 1979— Antenna and Space Platform Systems Conference

*J. C. Ward, Jr.*

Large antennas systems, large space platform systems.

NASA CP-2118
N80-19145 487 pp
Avail NTIS 1980

### Assessment of Carbon Fiber Electrical Effects

The risks associated with the use of carbon fiber composites in civil aircraft, the need for protection of civil aircraft equipment from fire-released carbon fibers.

NASA CP-2119
N80-19193 278 pp
Avail NTIS 1980

### Resource Management on the Flight Deck

*G. E. Cooper, M. D. White, J. K. Lauber*

Several approaches to the training and selection of aircrew, the psychology of the flight deck situation.

NASA CP-2120
N80-22283 247 pp
Avail NTIS 1980

### Proceedings of the Aero-Optics Symposium on Electromagnetic Wave Propagation From Aircraft

Wind-tunnel and flight experiments concerning natural and induced turbulence around an airplane and the effects on propagation characteristics of an emitter mounted in the airplane.

NASA CP-2121
N80-25588 666 pp
Avail NTIS 1980

### Cryogenic Technology

Part 1
NASA CP-2122
N80-72515 273 pp
Avail NASA GSFC 1979

Part 2
NASA CP-2122
N80-72516 159 pp
Avail NASA GSFC 1979

### Flight Mechanics/Estimation Theory Symposium

*A. J. Fuchs*

Methods of determining satellite orbit and attitude parameters.

NASA CP-2123
N80-28389 260 pp
Avail NTIS 1980

### An Assessment of Ground-Based Techniques for Detecting Other Planetary Systems

*D. C. Black, W. E. Brunk*

The feasibility and limitations of ground-based techniques for detecting other planetary systems, the level of accuracy at which these limitations would occur, the extent to which they can be overcome by new technology and instrumentation.

Volume 1. An Overview—Workshop Conclusions

NASA CP-2124
N80-18997 48 pp
Avail NTIS 1980

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### An Assessment of Ground-Based Techniques for Detecting Other Planetary Systems (cont.)

Volume 2. Position Papers

The capabilities of several astronomical interferometer system concepts, the effects of the Earth's atmosphere on astrometric precision.

NASA CP-2124
N80-25224 253 pp
Avail NTIS 1980

### Thermal Energy Storage: Fourth Annual Review Meeting

The development of low cost thermal energy storage technologies in terms of near term oil savings, solar energy applications, and dispersed energy systems for energy conservation policies.

NASA CP-2125
N80-22788 650 pp
Avail NTIS 1980

### General Aviation Propulsion

The quiet, clean, general aviation turbofan program; the general aviation turbine engine study program; the general aviation propeller technology program; the advanced rotary, diesel, and reciprocating engine programs.

NASA CP-2126
N80-22327 437 pp
Avail NTIS 1980

### Proceedings of the 14th Aerospace Mechanisms Symposium

Aviation propulsion, aerodynamic devices, and crew safety; space vehicle propulsion, guidance, and control; spacecraft deployment, positioning, and pointing; spacecraft bearings, gimbals, and lubricants; large space structures.

NASA CP-2127
N80-23495 327 pp
Avail NTIS 1980

### Lightning Technology: Proceedings of a Technical Symposium

Phenomenology, measurement, detection, protection, interaction, and testing; lightning electromagnetics, protection of ground systems, simulated lightning testing.

NASA CP-2128
N80-21927 444 pp
Avail NTIS 1980

### Validation Methods Research for Fault-Tolerant Avionics and Control Systems

*J. W. Gault, K. S. Trivedi, J. B. Clary*

A preliminary validation methodology for fault tolerant systems; a general framework for a validation methodology.

NASA CP-2130
N80-23008 105 pp
Avail NTIS 1980

### Eighth NASTRAN User's Colloquium

The general application of finite element methodology and the specific application of NASTRAN to a wide variety of static and dynamic structural problems.

NASA CP-2131
N80-24648 242 pp
Avail NTIS 1980

### Remote Sensing and Problems of the Hydrosphere. A Focus for Future Research

*E. D. Goldberg*

Problems of water quality which are addressable with remote sensors; the chemical, biological, geological, and physical dynamics of natural ecosystems.

NASA CP-2132
N80-23956 35 pp
Avail NTIS 1980

### Rotordynamic Instability Problems in High-Performance Turbomachinery

Diagnostic and remedial methods; rotordynamic control by feedback method, use of elastometric elements, use of hydrodynamic journal bearings and supports.

NASA CP-2133
N80-29706 463 pp
Avail NTIS 1980

### High Resolution Infrared Spectroscopy Techniques for Upper Atmospheric Measurements

*D. G. Murcray, J. M. Alvarez*

Infrared heterodyne techniques for detecting molecules predicted to be present but not yet detected in the upper atmosphere.

NASA CP-2134
N80-27866 109 pp
Avail NTIS 1980

### Time-of-Day Corrections to Aircraft Noise Metrics

*S. Clevenson, W. T. Shepherd*

The historical and background aspects of time-of-day corrections.

NASA CP-2135
N80-28150 81 pp
Avail NTIS 1980



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### Review of Spectroscopic Data for Measurements of Stratospheric Species

*A. Goldman, J. Hoell*

A review of the current status of experimental and theoretical spectroscopic data on molecules of stratospheric interest, recommendations for additional research.

NASA CP-2136
N80-26125 54 pp
Avail NTIS 1980

### Heterodyne Systems and Technology

Active and passive systems, local oscillators, tunable diode lasers, astronomical systems.

Part 1

NASA CP-2138
N80-29652 266 pp
Avail NTIS 1980

Part 2

NASA CP-2138
N80-29672 521 pp
Avail NTIS 1980

### Exploratory Meeting on Airborne Doppler Lidar Wind Velocity Measurements

*G. H. Fichtel, J. W. Kaufman, W. W. Vaughan*

The scientific interests and applications of the airborne Doppler lidar wind velocity measurement system to severe storms and local weather, convective phenomena, local circulation, atmospheric boundary layer, atmospheric dispersion, industrial aerodynamics.

NASA CP-2140
N80-26999 57 pp
Avail NTIS 1980

### Selected NASA Research in Composite Materials and Structures

Failure prediction techniques, buckling and postbuckling research, laminate fatigue analysis, damage tolerance, high temperature resin matrix composites, electrical hazards of carbon fiber composites.

NASA CP-2142
N80-28436 237 pp
Avail NTIS 1980

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